THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, WESTRAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. VI. OF VOL. I., 1931. LONDON, SATURDAY, FEBRUARY 7, 1931 Pp. 128—Price 1s.

No. 5606. Vol. CCXX. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 5

BAILLIÈRE, TINDALL & COX'S RECENT PUBLICATIONS.

Nicole's Psychopathology. 10s. 6d.
Rose & Carless' Surgery. 13th ed. 30s.
Allen's Diseases of Infants and Children. 15s.
Eyre's Bacteriological Technique. 21s.
Stedman's Medical Dictionary. 11th ed. 35s.
Cabot's Physical Diagnosis. 10th ed. 25s.
Mathews' Physiological Chemistry. 5th ed. 31s. 6d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

NOW READY. Size 6 × 9¼. Pp. xii.— 212. With 2 coloured Plates and 83 other Illustrations. Price 21s. Post 6d.

THE PATHOLOGY of DIABETES MELLITUS

By SHIELDS WARREN, M.D.

Director of Massachusetts State Tumor Diagnosis Service; Instructor in Pathology, Harvard Medical School.

Baillière, Tindall & Cox, 7 & 8, Henrietta-street, Covent Garden. London, W.C.2.

THE THOMAS SPLINT AND ITS MODIFICATIONS IN THE TREATMENT OF FRACTURES.

By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.).

Pp. 152. 85 Illus., with X-Ray Photographs, 3 Charts. 15s. net.

Oxford University Press, Amen House, London, E.C.4.

NERVOUS INDIGESTION

By WALTER C. ALVAREZ, M.D.

8vo. 15s. net.

"The book deserves to be widely read, especially by those whose experience is slight or is limited to hospital practice."
—THE LANCET.

Wm. Heinemann (Medical Books), Ltd.,
99, Great Russell-street, London, W.C.1.

8TH PRINTING. Pp. 480. V plates. 15s. net; post free 15s. 9d. abroad 16s. 6d.

CONTRACEPTION (BIRTH CONTROL)
ITS THEORY, HISTORY AND PRACTICE.

A Manual for the Medical and Legal Professions.

By
MARIE CARMICHAEL STOPES, D.Sc., etc.,
Fellow of University College, London.

Introductions by the late Prof. Sir WILLIAM BAYLISS, F.R.S., Sir JAMES BARR, M.D., and Dr. C. ROLLESTON.

A few press opinions of the 1st Edition:

MEDICAL TIMES.—"The book is unique and marks a new era."

THE LANCET.—"Much of the evidence contained in the book is quite unobtainable elsewhere."

Sir Archdall Reid in NATURE.—"Some such book as this had to be written, and this is very well written."

MED. REV.—"Should be read by all interested in racial welfare."

This book is the first manual on the subject, and is packed with both helpful and interesting matter and much that is new and noteworthy. London:
Bale & Danielsson, Ltd., 83-91, Gt. Titchfield-st., Oxford-st., W.1

BOOKS FOR SURGEONS.

BOWLBY, ANDREWES & KEYNES' SURGICAL PATHOLOGY. 8th Ed. 224 Illus. 21s.
SIR F. CONNOR'S SURGERY IN THE TROPICS. 99 Illus. 12s. 6d.
CADE'S RADIUM TREATMENT OF CANCER. 62 Illus. 15s.
BERTWISTLE'S SURGICAL RADIOLOGY. 21 Plates. 8s. 6d.
MASSIE'S SURGICAL ANATOMY. 121 Illustrations. 15s.
ROWLAND & TURNER'S OPERATIONS OF SURGERY. 7th Ed. 900 Illus. 2 Volumes. 70s.
ROMANIS & MITCHINER'S SCIENCE AND PRACTICE OF SURGERY. 3rd Ed. 716 Illus. 2 Vols. 28s.
ROMANIS & MITCHINER'S SURGICAL EMERGENCIES. 158 Illus. 18s.
WILLIAMS' MINOR SURG. & BANDAGING. 20th Ed. 10s. 6d.
WOOLLARD'S RECENT ADVANCES IN ANATOMY. 12s. 6d.
DARLING'S SURGICAL NURSING. 3rd Ed. 149 Illus. 8s. 6d.
OGILVIE'S RECENT ADV. IN SURGERY. 2nd Ed. 115 Illus. 15s
London: J. & A. Churchill, 40, Gloucester-pl., Portman-sq., W.1.

JUST ISSUED.

KAPLAN'S

RADIA[illegible]

[illegible]

See Saunders' Advertisement on Page 3.

CANCER OF THE BREAST,
AND ITS TREATMENT.

By W. SAMPSON HANDLEY, M.S., M.D.Lond., F.R.C.S. Eng.

Second Revised Edition. With 82 Illustrations. 30s. net.

Published for the Middlesex Hosp. Press by John Murray, London.

ABDOMINAL SURGERY OF CHILDREN.

By L. E. BARRINGTON-WARD, Ch.M., F.R.C.S. (Edin.), F.R.C.S. (Eng.).

Pp. 300. 82 Illustrations. 3 Colour Plates. 15s. net.

"Should make a wide appeal alike to surgeon, general practitioner, and student."—BRITISH MEDICAL JOURNAL.

Oxford University Press, Amen House, Warwick-sq., London, E.C.4

THE TONSILS AND ADENOIDS
AND THEIR DISEASES: INCLUDING THE PART THEY PLAY IN SYSTEMIC DISEASES.

By IRWIN MOORE, M.B., C.M.

Demy 8vo. 395 pp. 107 Illustrations. Price 21s. net.

"On any question regarding tonsils and adenoids, this exhaustive work by Dr. Irwin Moore must be regarded as the final authority for many a long day to come."—PRACTITIONER.

"Provides an admirable guide, reliable and up to date, on the subject dealt with."—MEDICAL TIMES.

"Should be in the library of the medical student, general practitioner and the consultant."—MEDICAL WORLD.

Wm. Heinemann (Medical Books), Ltd., 99, Great Russell-street, London, W.C.1.

READY NEXT WEEK. *ENTIRELY RE-WRITTEN.* *Pp. XVI.+562.*

With 49 Coloured Illustrations on 20 Plates and 123 Figures in the Text.
Demy 8vo. **35s.** net; postage 1s.

DISEASES OF THE TONGUE.

Being the third edition of Butlin's "DISEASES OF THE TONGUE."

By W. G. SPENCER, M.S., F.R.C.S., Consulting Surgeon, Westminster Hospital; and STANFORD CADE, F.R.C.S., Assistant Surgeon, Westminster Hospital. Surgeon, Mount Vernon Hospital, etc

London: H. K. LEWIS & CO. LTD., 136 Gower Street, and 24 Gower Place, W.C.1.
Telephone: MUSEUM 7756. Telegrams: "PUBLICAVIT, EUSROAD, LONDON."

The Treatment of

PNEUMONIA

with **OPTOCHIN**

(ETHYL-HYDROCUPREINE ALKALOID)

"The bacteria in Pneumonia are destroyed by Ethyl-hydrocupreine and even the blood drawn from patients so dosed will destroy Pneumococci—our *only instance* of specific drug therapy in acute general bacterial disease."

—*B.M.J.*, *ii.*/22, 420.

OPTOCHIN (Ethyl-Hydrocupreine) is manufactured in Howards' Ilford Laboratories, and may be obtained in ¼ oz. bottles of Powder and in 2 grain Tablets in bottles of 25 and bulk.

INFLUENZA, CORYZA, *etc.*

A NEW QUININE SALT

QUININE BI-SALICYLOSALICYLATE (HOWARDS)

known for convenience as

QUINISAN (Howards)

From published literature by eminent medical men :—

"The effect (of QUINISAN) was so remarkable that attacks of Influenza which began on the first day with shivering and temperature up to 104° F. and which were treated about midday only showed a little over 98·6° F. on the following morning and were entirely free from fever and all discomfort by the afternoon. These observations are based on 50 cases.

Quinisan had no unpleasant by-effects and when administered in the first 24 hours is an absolutely reliable remedy for cutting short the attacks."

4 grain Tablets, in Bottles of 25 & 100 from any Wholesale House.

HOWARDS & SONS LTD. (Est. 1797), ILFORD, LONDON

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS.

No. 5606. **LONDON, SATURDAY, FEBRUARY 7, 1931.** **CCXX.**

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ADDRESSES AND ORIGINAL ARTICLES.

Uses of Diathermy in Medicine and Surgery. By E. P. CUMBERBATCH, M.R.C.P., D.M.R.E. 281

Cancer and Tuberculosis: The Development of Malignancy. By THOMAS CHERRY, M.D. 285

Thrombo-angiitis Obliterans in Siam. By Prof. T. P. NOBLE, F.R.C.S. 288

Influenzal Meningitis. By JOHN GIBBENS, M.R.C.P. —(*Illustrated*)..... 291

Pleural Fluids Complicating Intrathoracic New Growths. By S. ROODHOUSE GLOYNE, M.D... 294

CLINICAL AND LABORATORY NOTES.

Purpura Hæmorrhagica Complicating Scarlet Fever. By CHARLES R. BOX, F.R.C.P., and RICHARD MASSINGHAM, M.R.C.S. 295

Estimation of Urea in Urine. By DUNCAN LEYS, M.R.C.P. 296

MEDICAL SOCIETIES.

Medical Society of London: Medical and Surgical Uses of Diathermy.—(*Illustrated*)..... 297

REVIEWS AND NOTICES OF BOOKS.

Blood: A Study in General Physiology. By Prof. L. J. Henderson..... 299

Cold in Relation to Skin Diseases. By H. Haxthausen, M.D..... 299

Handbuch der Kindertuberkulose. By Prof. Drs. St. Engel and Cl. Pirquet 299

Ethnos or the Problem of Race. By Sir Arthur Keith 300

Infant Nutrition. By Prof. W. McKim Marriott, M.D. 300

Epidemiological Essays. By F. G. Crookshank, F.R.C.P. 300

LEADING ARTICLES.

THE SMALL-POX HOSPITAL 301

RICKETS AND ADENOIDS.. 301

FOG ON THE MEUSE..... 302

ANNOTATIONS.

How Muscles Work..... 304

Hospitals, Drugs, and Panel Patients 303

National Council for Mental Hygiene 304

A New Urographic Medium 305

Antitoxin Treatment of Diphtheritic Paralysis.. 305

Burning During Anæsthesia 305

Evidence of a Virus in the Blood in Pernicious Anæmia 306

The Tees Survey 306

The Bulletin of Hygiene.. 307

A Primer on Fractures.... 307

A Test for Sugar in Urine 307

Beit Bequests and Fellowships 308

B C G at the Paris Academy of Medicine 308

CORRESPONDENCE.

The Structure of Neurosis (Dr. G. A. Auden)..... 321

Diet in Diabetes (Dr. Robert Gittins) 321

The Quality of Panel Service (Dr. C. C. Fenwick) 322

Mastoiditis in Diphtheria (Dr. J. D. Rolleston).... 322

Hominal Experiment (Prof. E. W. Schwartze)..... 322

Sex Determination (Major H. Williamson, M.D.).. 322

Puerperal Sepsis (Dr. J. C. G. Dickinson).... 322

Acute Toxic Hepatitis after Acriflavine (Mr. S. Y. Simpson) 323

A POST-GRADUATE COURSE

Motives and Mechanisms of the Mind. VI.—Law: The Rôle of the Father. By Dr. E. GRAHAM HOWE.—(*Illustrated*).... 309

SPECIAL ARTICLES.

Yellow Fever and Air Routes: Methods of Spread.—Rules for Air Routes.—(*Illustrated*) .. 315

Medicine and the Law: The New Cremation Regulations 316

Scotland: Edinburgh Hospital Problem..... 317

Berlin: Children's Holiday's.—Medical Women 318

Paris: Chest Surgery in the Sanatorium 318

Infectious Disease in England and Wales..... 319

THE SERVICES.

Health of the Navy in 1929 320

Royal Naval Medical Service.—Royal Army Medical Corps.—Army Dental Corps.—Royal Air Force.—Indian Medical Service.—Colonial Appointments.. 320

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Insanity and Divorce.—Representation of the Universities.—A Proprietary Medicines Bill.. 329

House of Commons: Inspection of Imported Meat.—Small-pox in London.—Mental Treatment Act.—Royal Veterinary College.—Employers and Health Insurance Contributions.—Local Authorities and Venereal Disease.—Slum Clearance.—International Patent Drugs Agreement.—Exterminationof Rats.—Strength of the R.A.M.C. 330

MEDICAL NEWS.

University of Cambridge.. 323

University of London.... 323

Royal College of Physicians of London 323

Scottish Conjoint Examining Board..... 324

New Freemasons' Hospital 293

Leicester Royal Infirmary 296

Donations and Bequests.. 303

A Lincolnshire Small-pox Hospital..... 320

London Jewish Hospital Medical Society 324

Medical Officers of Schools Association..... 324

Royal Microscopical Society 324

Congress of Thalassotherapy 324

Summer Cruise to Norway 324

Hospital Sunday 324

Coventry Hospital Saturday Fund 324

Keswick Cottage Hospital 324

Booking Seats for Outpatients 324

Dinner to Sir Marriott Cooke 324

Second Garton Cancer Prize 324

OBITUARY.

Sir Andrew Balfour, F.R.C.P.—(*With portrait*) 325

John Edward Gemmell, M.B. 327

Prof. Archibald Leitch, M.D.—(*With portrait*).. 328

INDEX NOTICE.

Index to THE LANCET, Vol. II., 1930..... 324

NOTES, COMMENTS, AND ABSTRACTS.

Scottish National Red Cross Hospital at Bellahouston. —(*Illustrated*) 333

Rebuilding Somers Town 333

If It had Happened Otherwise..... 333

The Earthquake in New Zealand 334

Medical Diary 332

Appointments 334

Vacancies 334

Births, Marriages, Deaths 334

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

Registered Office: VICTORY HOUSE, LEICESTER SQUARE, W.C.2.

Telegrams: "MEDICAVERO, WESTRAND, LONDON." *Telephone:* REGENT 0611.

President: Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., P.R.C.P., F.R.S.
Treasurer and Chairman of Council: C. M. FEGEN, M.R.C.S., L.R.C.P., D.P.H.
Trustees for the Reserve Fund:
Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., F.R.C.P. Sir JOHN ROSE BRADFORD, Bart., K.C.M.G., C.B., C.B.E., M.D., P.R.C.P., F.R.S. Sir HARRY BALDWIN, C.V.O., M.R.C.S., L.D.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

SUBSCRIPTIONS:—There is an entrance fee of 10s., and an Annual Subscription of £1.

The Invested Funds of the Society exceed £45,500. The Society is fully insured to an unlimited extent against all adverse costs and damages which may be awarded against Members in any action which the Society undertakes on their behalf.

Forms of application for Membership and full particulars may be obtained from the Secretaries at the above address.

THE MUSEUM GALLERIES

7 HAYMARKET LONDON, S.W.1

EXHIBITION OF

PORTRAITS
PICTURES
LANDSCAPES
By **THE HON. JOHN COLLIER**

WATERCOLOUR DRAWINGS OF PARIS
By **CECIL KING**

LANDSCAPES
By **TATTON WINTER**

CATHEDRAL TOWNS OF ENGLAND
By **A. J. MEYER**

Also MEZZOTINT, STIPPLE ENGRAVINGS and ETCHINGS BY LEADING ENGRAVERS

WEEKDAYS 10 a.m. to 6 p.m. SATURDAYS 10 a.m. to 1 p.m.

MUSEUM GALLERIES STUDIOS: 53 SHORTS GARDENS, DRURY LANE, LONDON, W.C.2

ADDRESSES AND ORIGINAL ARTICLES

USES OF DIATHERMY IN MEDICINE AND SURGERY.*

By E. P. Cumberbatch, M.B. Oxf., M.R.C.P. Lond., D.M.R.E.,

MEDICAL OFFICER IN CHARGE OF ELECTRICAL DEPARTMENT AND LECTURER ON MEDICAL ELECTRICITY, ST. BARTHOLOMEW'S HOSPITAL.

Treatment by diathermy has been practised in this country for a little more than 20 years; it may be said that it "came of age" last year. Its growth was slow during its first decade. During its second ten years, however, it grew rapidly, and to-day there is scarcely a region of the body to which it has not been applied.

The present occasion is opportune for reviewing the subject. The Medical Society of London includes many of the London authorities in the various branches of medicine and surgery. Some of them utilise diathermy in their specialties, and it will be interesting to hear their experience and opinions on its use in medicine and surgery. I much appreciate the honour of the invitation to open a discussion on the subject. Since diathermy is now employed in almost all the specialties, it is manifestly impossible for any one worker to acquire practical experience in every branch of medical and surgical diathermy. I have, however, seen diathermy "grow up," as it were, in the hospital where it was first employed in this country for medical and surgical purposes, and much of the early work on diathermo-therapy was conducted there. In opening this discussion I believe it will be the best plan to speak on the different specialties in turn, relating my own experience and then asking you for yours, as well as your comments and criticism. A few introductory remarks, however, on the properties and uses of diathermy in medicine and surgery may not be out of place.

Medical diathermy is given for the following purposes: to relieve pain and spasm, to raise temperature which is pathologically subnormal, to lower blood pressure which is unduly high, and to aid the resolution of inflammation. It is also given intentionally for the purpose of aiding the tissues to free themselves from local and general infection. Recently in the United States the entire body has been subjected to diathermy for the purpose of obtaining a so-called "therapeutic fever." In surgery diathermy is used for the purpose of coagulating abnormal tissue en masse. It should be mentioned that a current capable of producing diathermy can also be used to kill tissue by desiccating it—i.e., by depriving it of water. This form of surgical treatment, known as *desiccation* or *fulguration*, is of high value in the treatment of morbid tissue which does not extend deeply below the surface. The post-operative reaction is scarcely noticeable, and the scars are the best obtainable. This form of treatment is little known to the general medical profession. I can recommend it in particular to the dermatologist. A current capable of producing diathermy can also be made to divide tissue and excise it like a knife, and, at the same time, seal the divided capillaries and lymphatics. It should be mentioned that these two last-mentioned forms of treatment, strictly speaking, are not diathermy.

Treatment of Special Regions.

I shall now take the various specialties in turn and speak on the uses of diathermy in each one.

GYNÆCOLOGY.

It is in the treatment of certain diseases peculiar to women that medical diathermy has achieved the most striking success. By means of a suitable method the urethra and cervix can be safely and painlessly heated to a temperature of 114° F. or nearly a degree higher. The object of heating them to this high temperature is to aid them in freeing themselves from infection. This treatment is given twice weekly during one or two intermenstrual periods. Its effect is to remove all clinical signs of inflammation. If the infection is gonococcal the organisms disappear. The *Streptococcus hæmolyticus* also disappears. Diphtheroid and coliform bacilli, and non-pyogenic streptococci and staphylococci, if present in the cervical secretion, sometimes persist after diathermy even though all signs of cervicitis disappear.

The results above-mentioned were obtained in 90 per cent. of gonococcal cases, and in 80 per cent. of non-gonococcal cases. The patients were followed up for two years, and the results were found to be permanent. The cases in which the treatment failed include those in which relapse occurred at later stages after apparent cure. Failure occurred in those cases where there was widespread infection of the pelvic supporting tissues.

The most effective method of subjecting the urethra and cervix to diathermy and obtain the high temperatures named is that devised by Dr. C. A. Robinson. He elaborated it during the ten years when he was investigating the effects of diathermy in pelvic diseases in the electrical department of St. Bartholomew's Hospital. He found that it was necessary to introduce an active electrode into the channel of the urethra or canal of the cervix. Simpler methods, in which an electrode is placed in apposition with the cervix, were found to be unsatisfactory. Time does not allow a description of Dr. Robinson's technique. His method of heating the urethra and cervix to a temperature of 114° to 115° F. is very ingenious. It needs skill and practice in intrapelvic manipulation, but it is the most efficient method that has yet been devised.

I might digress here for a moment and say that temperature as high as those mentioned can only be obtained in regions which are close to the electrodes. I mention this fact because it is sometimes stated that *any degree* of heat can be obtained in *any part* of the body by means of diathermy. Down in the depths of highly vascular regions such as the thorax and abdomen I believe it impossible to procure more than a very slight rise of temperature—that is, when the electrodes are placed in contact with the skin. In the pelvis, however, one of the electrodes can be placed in close proximity to some of its organs, and these can be subjected to the maximum, or nearly the maximum, permissible degrees of diathermy.

The tubes and ovaries can be subjected to diathermy by using a special vaginal electrode. By reason of their deeper situation it is not possible to heat these parts to the same high temperature as the urethra or cervix. The relatively minor degree of therapeutic pyrexia that can be produced in the tubes is very often successful in bringing *salpingitis* to an end, both

* Opening a discussion at the Medical Society of London on Jan. 26th.

in gonococcal and non-gonococcal cases. In Dr. Robinson's experience the proportion of successful results reached 80 per cent. If pus is present in the tubes, however, surgical operation is necessary. If the pus is gonococcal it tends to become sterile of its own accord. Diathermy may then be applied to the infected cervix and afterwards to the tubes. In some cases this treatment seems to aid absorption of the sterile pus.

General pelvic diathermy is very successful in *dysmenorrhœa*, due to a minor degree of salpingitis. On the other hand, the treatment has no permanent effect in cases of dysmenorrhœa of the spasmodic type. Patients say they are much better during the period after the first course of diathermy, but if further courses are given they say that their improvement is not maintained. Ultimately they return to their original condition.

General pelvic diathermy seems to influence the endocrine functions of the ovaries. If cessation of menstruation is premature, this treatment will frequently cause its return even though it may have been absent for two, three, or even more years. In one case it returned after ten years' absence. Another fact which seems to indicate the influence of diathermy on the endocrine functions of the ovaries is the cessation of climacteric bleeding during the treatment and the alleviation of the symptoms which sometimes occur prior to the change of life.

The statements I have made on the effects of diathermy in diseases of women are based on the results obtained by Dr. Robinson during the ten years when he worked in my department in St. Bartholomew's Hospital. He has conducted similar work for a still longer time at the West Middlesex Hospital. He has acquired an enormous and unique experience; and I hope that he may be persuaded to publish it before long.

Before concluding my observations on diathermy in gynæcology I should like to call to your attention the work of Dr. Robinson in the treatment of *puerperal fever* by the same agent. By means of intrapelvic diathermy he succeeded in curing 33 out of 39 cases. This work is entirely original. As far as I am aware no other method has been so successful. The usual prophylactic precautions were taken, and diathermy was not applied in any of the cases before the fever had been in existence for seven days. Dr. Robinson has communicated his results to the Hunterian Society and to the Section of Electrotherapeutics of the Royal Society of Medicine.

DISEASES PECULIAR TO MEN.

I believe there are some specialists in men's diseases who utilise diathermy in the treatment of certain maladies of the prostate, epididymis, &c. I should like to hear the results they obtain. My own experience extending over 12 years, and derived mainly from cases which had resisted treatment elsewhere, leads me to conclude that results nearly as consistent as those obtained in infection of the uterus and its adnexa can be procured in certain infective diseases of the organs peculiar to men. The most successful results are found in cases of gonococcal infection. The best of all are obtained in gonococcal infection of the epididymis and other scrotal contents. The rapid alleviation of the pain and the subsidence of the swelling and disappearance of the tenderness can be regarded, I think, as one of the most constant phenomena of therapeutics.

Most of the cases of *gonococcal prostatitis* and *vesiculitis* which I have had under my care or observation have responded satisfactorily to diathermy. The treatment was applied by way of a rectal electrode. Cases in which the gonococci could not be made to disappear from the secretion under other forms of treatment were no longer found after diathermy. Some of these were afterwards subjected to a marriage test, and they passed it satisfactorily. The greatest difficulty is experienced in cases giving a history of gonorrhœa a long time ago and a persistent morning gleet. Gonococci have been searched for from time to time but never found. I have treated a number of cases of this kind by diathermy. In a few the pus cells disappeared and the gleet was not observed after the cessation of the treatment. More often, however, the pus cells could not be made to disappear, and the gleet persisted. Consequently no final conclusion can be made in regard to the absence or presence of gonococci in the tissues before or after diathermy.

In regard to *anterior urethritis* the action of diathermy is disappointing. It does not bring about the rapid abortion of the infection that occurs when urethritis in the female is treated by the same agent. I have treated a few cases by diathermy, but the discharge came to an end no sooner than might have been expected if other methods had been employed. In the methods which I used for subjecting the male urethra to diathermy, there was no passage of instruments into the urethra. One of the electrodes was placed in apposition with the prostate, the other with the penis. It is just possible that the inclusion of the prostate in the diathermy may prevent metastatic infection.

In the discussion on the uses of diathermy in diseases of the prostate I should like to hear the experience of the surgeons who have employed the operation introduced by Luys for punching out that part of the middle lobe when it obstructs the urethra. My own experience of diathermy in senile enlargement of the prostate is mainly restricted to that of a few cases in old men who were unfit for surgical operation. I treated them by *medical* diathermy, but it is doubtful whether they derived any benefit. Quite recently, however, I have had three cases in men aged 60, 63, and 60 respectively. In these cases the symptoms of obstruction were not of long duration. The patients complained of difficulty in emptying the bladder on rising in the morning, and of the necessity of getting up at night to micturate. Diathermy removed these symptoms. One patient has been free for three months, another for the same length of time, and the third for 16 weeks. It is possible that the obstruction in these cases was due to congestion of the enlarged prostate. Diathermy would be expected to remove it.

DISEASES OF JOINTS.

It is probable that most of those who are present have been troubled with difficult cases of *arthritis*. Those who practise the physical branches of medicine are troubled with them all the time. If the cases sent to the electrical department of a hospital were classified numerically it would probably be found that arthritis headed the list. If they were classified in accordance with the degree of benefit derived from electrical treatment it would have been found, before the days of diathermy, that arthritis came near the bottom of the list. Since the advent of diathermy, however, it has obtained a better position. Near the top of the list would be placed gonococcal arthritis. In the treatment of this type of joint disease it is imperative that the prostate and vesicles (in men) and the cervix uteri (in women) should be subjected to the diathermy. It is not necessary to apply it to the joints themselves. This form of treatment brings

the arthritis to an end, and it does so—in my experience—invariably. If the cases are early it can truthfully be said that cures are obtained. In late cases, in which permanent structural changes have occurred in the joints, the arthritis is arrested. The fire is extinguished, and it remains to effect such repair of the joints that can be brought about by means of physical treatment. If non-gonococcal infective arthritis in women is investigated, it will frequently be found that cervicitis exists, even though there may be no outward or visible evidence of it, and no notice of it on the part of the patient. In cases of this kind the application of diathermy to the cervix will bring the arthritis to an end in about 75 per cent. of the cases.

It is probable that infection of the *prostate* by organisms other than the gonococcus can give rise to arthritis in men. I have had cases which presented no bacteriological evidence of gonococcal infection and gave no history of it. In some of these the treatment of the prostate and vesicles by diathermy brought the arthritis to an end. It is possible that more of the cases would have responded to the treatment if the diathermy had been administered by the *urethral* instead of the *rectal* route. The vesicles can be heated to the highest temperature by the rectal route, but in order to heat the whole prostate to the same degree an active electrode should be introduced into the posterior urethra. A special electrode has been devised for this purpose by Dr. G. F. Stebbing. I have not yet used it, but the treatment of the prostate by the urethral route is well worth investigation.

There is another variety of arthritis in women which responds well to pelvic diathermy. I refer to the type which is recognised by some workers and named *menopausal arthritis*. It occurs just after, or a little before, the cessation of menstrual life. The menopause may, in fact, be premature. The patients say that they have increased in weight or become stouter. On examination it is found that there are pads of tissue resembling fat just above the knees and in the upper arms. It is in the knees that pain is often felt. In these joints the synovial membrane is thickened. The treatment of this type of arthritis by pelvic diathermy relieves the pain and causes the disappearance of the pads above-mentioned. If the cessation of menstruation is premature the return of the periods is often observed by the patient. These facts have led my co-worker, Dr. Robinson, to formulate the theory that this type of arthritis is due to disturbance of the endocrine function of the *ovaries*. He has an interesting collection of cases of this kind at the London Clinic.

It is too soon to speak about permanence of results, but if the cases are treated before permanent organic changes have taken place in the joints, it is possible that real cures may be obtained. Two private patients personally known to me had the treatment in the early stages of their complaint. One was treated 15 months ago, and the other four years ago. Both now are perfectly well.

Before leaving the subject of arthritis I would like to present the following hypothesis as a "bait" to those present in case any member might "rise to it." I suggest that there is a "climacteric" arthritis which may occur in men at the time of life when changes occur in the prostate. Men are prone to develop arthritis between the ages of 50 and 60, and I know of cases in patients at this time of life which have derived considerable relief after prostatic diathermy. Apart from clinical results, however, this is a matter for speculation, and he who possesses the largest amount of clinical and pathological knowledge and the greatest agility in argument will outrun his opponent in the discussion.

DISEASES OF THE CIRCULATORY SYSTEM.

There are some diseases of the circulatory system for which diathermo-therapy is recommended by certain authorities. The late Sir Clifford Allbutt was a strong advocate of the use of high-frequency currents for *hyperpiesia*. In an article on the subject by him in the "Index of Treatment" (8th ed.) he mentioned that Lewis Jones had likewise obtained good results and attributed them to diathermy. Speaking from my own experience, I should say that the few cases which have been referred to me derived further benefit from general diathermy after general medical treatment had been instituted. Pain in the chest, dyspnœa, and headache were relieved. In regard to its effect on the *blood pressure* general diathermy, in my experience, reduces both the systolic and diastolic values, but if they are not very high at the commencement of the treatment (say in the vicinity of 200 mm. systolic and 100 mm. diastolic) they return in a day or two to their original values. But if they are much higher at the beginning of treatment the reduction is more sustained. It lasts, at any rate, during the period of the course of treatment. In regard to subsequent values as time goes on I cannot say much. Two patients have been under my care for a number of years. They obtain relief from diathermy, go away, and return after 6 to 12 months saying that their symptoms have returned. I find that the blood pressure is sometimes at its original value, sometimes a little lower. Relief is again obtained from diathermy, and they go away for another period until their symptoms return.

In the treatment of *angina pectoris* diathermy has been recommended by Prof. John Hay. It was originally advocated for this disease by Nagelschmidt, the German protagonist of diathermy. Dr. John Dyson has procured freedom from attacks for periods as long as two years. Some of his cases, I believe, were sent to him by Prof. Hay. I have had no experience of cases in which there were sudden attacks of violent pain. Other cases in which the patients complained of pain in the chest only during exertion ("angina without agony") have been referred to me for diathermy. Three out of five cases said they felt no better after the treatment. In the fourth case the patient had no pain for at least six months after a course of diathermy. The fifth patient said she did not feel much better directly after the diathermy. But soon after her return to her home in the country she wrote to say that she had lost all her symptoms and was able to walk up hills without feeling pain or shortness of breath.

In regard to *intermittent claudication*, I am rather disappointed with the results of diathermy. Some of my cases appeared to have been quite distinctly benefited by diathermy. These cases were in very active and hard-working men, but rest had been prescribed for them by the good physician. In two cases the prescribed rest could not be obtained, and no benefit was derived from diathermy. The limping persisted. In one of the cases, however, there was a complaint of pain in the foot which kept the patient awake at night. This symptom disappeared.

DISEASES OF THE LUNGS.

The treatment of *lobar pneumonia* by diathermy has caused much comment. Several hundred cases have been treated by its means in the United States by Eaton Stewart. Much has been said for and against

this form of treatment. It has been tried by Dr. Morley Fletcher in this country in 12 cases. It was found to relieve pain and procure sleep. The patients preferred it to poultices and antiphlogistine. In the West Middlesex Hospital 200 cases have been treated under the direction of Dr. Robinson. Diathermy has been adopted there as the standard treatment, and a small ward has been equipped for the purpose. It is much too soon to say anything final in regard to the effect of diathermy on the mortality-rate.

Pulmonary diathermy has also been recommended for the so-called *idiopathic asthma*. My own experience is limited to two cases which had resisted other forms of treatment. The patients liked the treatment, and said that their attacks were less severe and frequent during the course of diathermy.

DISEASES OF THE ALIMENTARY CANAL.

There is not much to say on the effects of diathermy in diseases of the alimentary tract. In *mucous colitis*, however, I have found pelvic diathermy of high value. The cases I have treated have been in young women. The treatment administered twice weekly for three or four weeks caused the disappearance of the mucus and a reduction of the frequency of defæcation until properly formed stools were passed once a day. Some of the patients relapsed, but repetition of the treatment had the same effect. Dr. Claughton Douglass has treated some cases by the same method and has had good results.

In painful *fissure of the anus* I usually find that rectal diathermy gives prompt relief. Pain due to internal hæmorrhoids has always been relieved by the same treatment in the few cases which I have had under my care. There are some workers in this country who employ surgical diathermy for the treatment of hæmorrhoids. Others destroy them by fulguration (desiccation).

DISEASES OF THE SKIN.

Certain abnormalities of the skin can be well treated by surgical diathermy or fulguration. Smooth non-contracting scars are left after the former. After fulguration, as I have already said, the reaction is scarcely noticeable and the scars are perfect. Papillomata of the skin can be soon dried up, by fulguration, into small hard masses which can then be picked off. The same method is rapid and effective for the so-called "mulberry nævus," for capillary nævus, for telangiectasis, for flat and pedunculated warts, and for pigmented areas of skin. For epithelioma of the skin surgical diathermy is a most useful form of treatment. I have had at least one case where it succeeded after radium had failed. Diathermic coagulation and fulguration are both of value in cases of *lupus vulgaris*. Of the two I prefer the latter, because the scab following the treatment acts as a protective dressing and covers the treated part until healing is complete, whereas after diathermic coagulation the slough has to separate, leaving, for a time, an open wound. In the treatment of lupus vulgaris by these electrothermic methods the chief difficulty is experienced in cases presenting scarred areas with persistent nodules after other forms of treatment have been tried. I have kept one case under observation and occasional treatment for 15 years. It was sent to me after a course of X ray treatment. Fulguration caused the nodules to disappear. But as time elapsed minute areas of recurrence were observed. Further fulguration was always successful, and it is interesting to note that the scars maintained their good character, despite the repetition of the treatment. One area, not treated by X rays, showed no recurrence after the first fulguration which was given ten years ago, and the scar remains as good as ever.

DISEASES OF THE EYE.

Diathermy is of value in certain diseases of the orbit and eyelids. It was employed by Iredell and Meadows-Ryley as far back as 1918 in some cases of *glaucoma*. In a few of them the pain was relieved and the tension reduced. Howitt and Morgan employed it successfully in cases of iridocyclitis. In a publication in the *British Journal of Ophthalmology*, August, 1930, Figdor described his results in the treatment of certain eye diseases. He found that chronic senile conjunctivitis invariably did well. The major number of cases of cyclitis and iridocyclitis were relieved, and a few were apparently cured. In glaucoma the tension was reduced—at any rate temporarily—and in two cases it appeared that the condition had been arrested.

In two cases of *gonococcal iritis* which have been under my care the pain was at once alleviated by orbital diathermy, and the inflammation was brought to an end. In these cases the treatment was completed by subjecting the primary infective foci to diathermy. In one of them an iridectomy was afterwards performed without any misadventure. Dr. Robinson successfully treated two cases of iridocyclitis by applying diathermy *to the cervix uteri* and freeing it from the infection which was present in the last-mentioned part. The eyes themselves were not treated directly.

Xanthelasma palpebrarum can be successfully treated by fulguration. I find it necessary, after a preliminary application of sparks, to scrape away the dried part and then repeat the application. The dried layer is again removed, and the process repeated until the xanthelasma is wholly removed. The residual scars are soft and inconspicuous, and they do not shrink.

DISEASES OF THE UPPER AIR PASSAGES.

It is in the treatment of malignant disease of these regions that surgical diathermy has some of its most meritorious results. On this subject there is little I can say that the surgeons do not know themselves. In regard to technique the placing of the active electrode *on the surface* of the tissue that is to be killed has the disadvantage that the operator has insufficient knowledge or control of the depth to which the coagulation proceeds. If, however, a single needle is used in place of the disc or ball electrode and introduced into the tissue the depth of coagulation is much more under control. It proceeds not more than 2 or 3 millimetres beyond the point of the needle. If a malignant growth is eradicable the needle can be inserted in the healthy surrounding tissue in closely adjacent parts, the process being repeated until the growth is enveloped all around in a barrier of coagulated tissue, and isolated from the healthy parts. A portion can then be cut out for examination, and the remainder coagulated by means of a surface electrode, or—better—excised by the cutting current. The practice of coagulating a malignant growth and then scraping away the coagulated portion is, in my opinion, not to be recommended. Bleeding is very likely to occur, and one of the great advantages of properly conducted surgical diathermy is lost. The use of a scalpel as an active electrode for the purpose of combining cutting with coagulation is also, in my opinion, a faulty method and should not be used for the removal of malignant growths, at any rate when they are very vascular. It is a blind method, and the operator is unable to see the point or edge of the knife nor can

he tell whether he is cutting through living or coagulated tissue.

It would be of interest to hear the opinion of the laryngologists on the *removal of tonsils* by the electrothermic methods. The public have heard about a new method of removing tonsils "which does not need a stay in a nursing home or a general anæsthetic." There has also been some recent correspondence on the subject in the medical journals. It would seem that diathermic coagulation of septic tonsils would avert the spread of infection which is a risk that attends excision by the scalpel.

Use of the Cutting Current.

Machines are now made for generating a special high-frequency current capable of dividing tissue and, at the same time, coagulating the divided surfaces and sealing the microscopic vessels as they are severed. Healing by primary union will take place, but it seems that the current has to be modified for each type of tissue—skin, fat, and muscle—if such union is to take place. A machine has been constructed under the direction of Prof. Harvey Cushing and Prof. W. T. Bovie in the United States. It is employed by the former for the excision of cerebral tumours. In this country the pioneer worker with the cutting current is John Anderson, of Dundee. His work on the removal of the cancerous breast by its means is well known. In London the cutting current has been employed by Mr. G. Gordon-Taylor, Mr. Sampson Handley, Mr. Girling Ball, Mr. Douglas Harmer, Mr. J. E. H. Roberts, and others. Mr. Roberts uses it for his operations on the chest wall. The cutting current is a new weapon in surgery, and it will be interesting to hear the experience of the surgeons who have employed it.

CANCER AND TUBERCULOSIS:
THE DEVELOPMENT OF MALIGNANCY.

By Thomas Cherry, M.D., M.S.,
CANCER RESEARCH FELLOW OF THE UNIVERSITY OF MELBOURNE.

THE aim of this paper is to elucidate the part played by the lymphocytes in the development of malignancy. In the course of experimental work on the relation of cancer to tuberculosis the gastro-splenic region has been examined by microscopic sections in 625 mice. About half of these had been inoculated with small doses of tubercle bacilli; the others were control animals of the same strain, kept under similar conditions of food and surroundings until death took place from natural causes. In the inoculated animals a small-cell infiltration, consisting almost exclusively of lymphocytes, is often found in the fat about the splenic vein as well as in other parts of the body. Acid-fast bacilli are not common, but they have been found in the spleen and enlarged lymph glands and among small dense collections of lymphocytes. In the second year of these experiments an outbreak of pseudotuberculosis began which has involved both the inoculated and the control mice. The disease is of a somewhat peculiar type, as the liver is the organ most commonly involved, the lesions not infrequently extending to the adjoining organs and tissues. The lungs are affected in about one-third of the cases. As the cells in these lesions are predominantly polymorph, this spontaneous epidemic has afforded material for a comparison of two inflammatory conditions, each characterised by its special type of white blood corpuscle.

In the mouse the pancreas is of the diffuse type common to most of the rodentia. It extends from the curve of the duodenum, behind the curvature of the stomach, to the spleen and left kidney. Small and large clusters of lobules ramify in this region, attached to these organs and to the retroperitoneal structures by delicate strands of connective tissue. The organ can hardly be described as consisting of lobes, as the clusters of alveoli vary greatly in size and arrangement. The secreting cells are of the ordinary pancreatic type, cubical or low columnar in form, containing rounded nuclei which may stain uniformly or show five or six nucleoli. A section of an alveolus usually shows six or eight cells. Very fine clefts between adjoining alveoli give a characteristic appearance to the sections. Islets of Langerhans are common in the larger clusters of lobules. In most instances of infiltration masses of lymphoid cells—presumably enlarged glands—are found near the pylorus and between the stomach and spleen, more or less surrounded by lobules of the pancreas.

Mice inoculated with very small doses of tubercle bacilli of the human or bovine type show no symptoms of being in any way abnormal for perhaps several months. Acid-fast bacilli have, however, been subsequently found in the spleen and enlarged lymph glands of these mice when death has occurred 10, 12, and 16 months after inoculation. In three cases a tuberculoma has formed, and this group of mice exhibited in addition the following lesions: enlarged spleen and lymph glands, lymphocytic infiltration of the subcutaneous tissue near the site of inoculation, small-cell infiltration of the liver, lymphoid marrow, and leukæmic blood.

Pseudotuberculosis is the name given to a number of diseases in the lower animals which have no close relationship to one another but have this point in common: that they are not in any way connected with the tubercle bacillus. To the naked eye the lesions consist of nodules closely resembling miliary tubercles. In my mice the lesions are found in the lungs, pleura, myocardium, intercostal muscles, and subcutaneous tissue; in the abdomen the liver, peripancreatic fat, and walls of the stomach are affected. By the coalescence of many nodules a large part of one or more lobes of the liver may be replaced by necrotic tissue. Under the microscope the appearances are not unlike those of an ordinary abscess, except that granulation tissue is scanty. The necrotic focus is bounded by a broad area of cells, most of which are polymorphs; among them there are large cells which usually have a single small round nucleus lying in clear hyaline cytoplasm. There is no appearance of giant cells. The capillaries lying further from the centre are often engorged, but fibroblasts are scanty and there is no capsule. Outlying lines and areas of cells usually exhibit more than 60 per cent. of polymorphs.

The presence of such nodules in mice inoculated with tubercle bacilli raises the question whether they are not tuberculous, the absence of the typical histology of the tubercle being of little weight as evidence when the animal is a small rodent. The nodules have been carefully searched for acid-fast bacilli and injected into guinea-pigs, with negative results. The absence of the lymphocytic reaction is also strong negative evidence.

The phrase "unstable lymphoid system of the mouse" is met in current literature. This idea is based upon such facts as the wide divergence in the blood counts from the same animal when taken at short intervals, the frequent occurrence of a large spleen with or without enlarged lymph glands, and

other conditions resembling those of leukæmia or pseudoleukæmia. Mice with such a syndrome may have lived to the average age, but in some instances they have been proved to be the carriers of one or other infective disease. The carrier problem has also come up in regard to other laboratory animals. Steps were taken to minimise these conditions in my mice three years ago, and they are much less common now than they were in the progenitors of my stock, which now numbers about 1200 mice. Hence I am inclined to regard all such lymphoid conditions as dependent on some pathological condition, even if we are ignorant of its exact nature.

Experiments.

In order to compare the appearances seen in the pancreatic region, 50 mice have been selected from each class—control mice with pseudotuberculosis and those inoculated with tubercle bacilli. A summary is given of the findings in 12 mice from each of these groups, eight representing the intense grade of infiltration and other changes and four the less marked and presumably earlier stage of the same lesions, but the sequence of the microscopic signs of each reaction is uniform in all of the 50.

PSEUDOTUBERCULOSIS AND CHANGES IN THE PANCREAS.

(287). Nodules of pseudotuberculosis in the wall of the stomach, and the usual zones of infiltration with polymorphs. Two clusters of lobules of the pancreas lie between two enlarged lymph glands. They retain their normal appearance as to cells and nuclei and contain two islets. The lymph glands contain much blood, but the cells are not densely crowded together. The blood in a large vessel is leukæmic, the white cells being 87 per cent. polymorphonuclear.

(299). An extreme case of pancreatic cells disappearing in an adhesion at the pylorus. Individual lobules are surrounded by a finely fibrillar tissue containing many fibroblasts. Their nuclei are still arranged in imperfect circles, but very little cytoplasm is left around them. Further from the muscular coat the pancreatic alveoli are little altered, but are infiltrated with polymorphs. A dense cluster consists almost exclusively of those cells. Fibroblasts are abundant on the free peritoneal surface of the adhesion.

(305). A pseudotuberculosis adhesion containing a cluster of nodules has formed between the liver and pylorus. The enclosed lobules of the pancreas have almost completely disappeared, some alveoli being represented by a complete circle of nuclei and others by one or two nuclei the identity of which is certain, or by nuclei whose identity is doubtful. Polymorphs and fibroblasts are common on the edge of the adhesion. In an adjacent hepatic venule the blood count is 66 per cent. polymorphs.

(326). A small pseudotuberculosis nodule in the liver and a well-organised adhesion between the pylorus and pancreas are seen in this section. The adhesion consists of fibroid tissue in which are many blood-vessels. The lobules of the pancreas lying in it are easily recognised, but the alveoli are more widely separated than usual. On the edge of the adhesion some of the pancreatic cells lying among the fibrillæ consist of a normal nucleus lying in a pear-shaped cell. There are no indications of activity in the nucleus. An adjacent lymph gland is not densely crowded with nuclei and contains many polymorphs. In the duodenum Brunner's glands are far more cystic than normal; their nuclei are unchanged.

(332). There are many nodules in the liver and walls of the stomach, with widespread infiltration and adhesions. Pancreatic cells are embedded in the inflammatory tissue on both aspects of the stomach. The lobules are becoming indistinct and the alveoli broken up, until all signs of their identity disappear. On the edge of the adhesions the polymorphs represent 80 per cent. of the infiltrating cells.

(385). A large cluster of nodules lies between the organs in the gastrosplenic region. A portion of the pancreas adjoining the stomach is infiltrated and is disappearing among the polymorphs and fibroblasts. In all parts of the infiltration the polymorphs greatly preponderate.

(407). A thin margin of the liver forming part of the capsule of a large pseudotuberculosis mass compresses the lobules of the pancreas which adjoin the pylorus. There are many polymorphs and fibroblasts in an early adhesion, while the alveoli of the pancreas are irregular in size and shape and are disappearing in the infiltration with which they are surrounded.

(351). This is an early stage of infiltration, several pseudotuberculosis nodules being embedded in the adjacent lobes of the liver. There is a large pancreatic lymph gland showing the characteristic light-staining areas of polymorphs. The pancreas shows early infiltration with polymorphs, which are lying in the clefts between the lobules, between the cells of the alveolus, and around the margin of the islets. Hence the clefts and the alveoli appear to have a more open structure than normal. The blood is leukæmic in a large vein. Other parts of the pancreas appear normal.

(352). An early stage of infiltration of the lobules at the pylorus is combined with a condition of the liver indistinguishable from that in the preceding mouse, the description of which will serve also for Nos. 338 and 297.

THE PANCREAS IN THE INOCULATED MICE.

(10). Inoculated between the shoulders with 120,000 tubercle bacilli, this mouse died ten months after, aged 16 months. It was small and wasted and had very large glands in the neck, extensive lesions in the thorax, and a tumour 1·5 cm. in diameter in the gastrosplenic area. The tumour consists mainly of small round cells with deeply staining nuclei, and a necrotic area contains immense numbers of acid-fast bacilli. In parts it has a pseudocapsule formed of round and spindle cells and fine fibrillæ. By way of adhesions, the round cells penetrate the capsule of the liver and the coats of the stomach and separate the pancreatic lobules. The sections of the lobules have lost their normal shape and those close to the capsule are quite unrecognisable, as the cells lie in irregular clusters or singly amidst the small-cell infiltration. They are often elongated into oblongs or triangles with two or three large vesicular nuclei. The cytoplasm of such a cluster appears to have fused. Many of the large nuclei contain two or three small deeply staining points of chromatin.

(44). This mouse died 13 months after inoculation, with a spindle- and mixed-cell sarcoma at the point of inoculation, similar growths in the subjacent axillary glands, and a very large liver, half of which consists of sarcoma tissue of the same type. A large area of the pancreas lying between the liver and spleen shows the ordinary separation of the lobules from one another. Within the alveoli the cells have lost their normal arrangement and often also their normal shape. They are smaller and more irregular in outline than normal, and there is no trace of the two zones. The nuclei are large, very often vesicular, and sometimes exhibiting large nucleoli. The tissue of the stroma also appears to be active, the elongate nuclei and the capillary blood-vessels are distinct, while the prominent nuclei of the ducts make these structures stand out in a manner quite unusual in the mouse. There is no great amount of small-cell infiltration in this instance.

(33). A young mouse inoculated with 100,000 tubercle bacilli; it died after four months, aged 8 months. There is a fibrocellular adhesion at the pylorus in which the round cells are 90 per cent. lymphocytes. It contains several lobules of the pancreas, which closely correspond with those described in the preceding mouse. Some are little altered except that the nuclei are very large and vesicular. Others have lost their normal shape and arrangement but still have the large conspicuous nuclei. Sections of the pancreatic ducts are very numerous in this specimen; their epithelium has large deeply staining nuclei which sometimes touch one another where they form a ring round the lumen.

(112). A small mouse which died 12 months after inoculation with 25,000 tubercle bacilli. The chief lesion is an adenocarcinoma of the stomach, the walls of which are heavily infiltrated with small cells. An adhesion involves part of the pancreas which shows large areas of lobules with the clefts distinct, the alveoli being replaced by cells lying close together, not arranged in tubules or circles, and possessing large nuclei, which often almost fill the body of the cell. The vessels and ducts of the pancreas also have large and prominent nuclei.

(851, 894, 909D, 950). These illustrate the early stages of proliferation of the pancreas. Most of the lobules in a given section are normal, but in the neighbourhood of an adhesion or of a small well-defined collection of lymphocytes these cells may be traced between the lobules, and changes in the shape and arrangement of the cells, and especially in the appearance of the nuclei, become apparent. No. 44 may be taken as a type of these four mice.

(667, 820, 849, 963). These are advanced cases. There are lymph glands more or less surrounded by the lobules of the pancreas. The small-cell infiltration is often intense and extends through many adjacent lobules. In most of these cases lobules are also embedded in an adhesion to the pylorus. In about half the advanced cases the lobules are closed up, in half they are more widely separated by the infiltration. The alveoli have lost their normal outline and are represented by one or two or a clump of half a dozen cells. The shapes, as already indicated, may be called bizarre. The nuclei are large, roundish, and very prominent,

and there are often two in a single small, misshapen cell. One or two prom nent nucleoli are always present, but signs of mitosis are rare. In about one-fourth of this group of mice the interlobular tissue with the ducts and blood-vessels shows signs of similar activity.

Of the 12 mice inoculated with tubercle bacilli, three are examples of the reaction of the pancreas when associated with the presence of tuberculoma, sarcoma, and carcinoma respectively. The others are selected from the mice in which there is no tumour in order to illustrate varying stages of the same process. The phenomena in all cases are the same, and the proliferative changes may run on to malignancy. There have been four examples of carcinoma simplex in which the lobules have not only lost their boundary clefts but have run together over areas measuring 5 mm. or more in diameter. There are no indications of alveoli in these areas, and the cells in all parts lie in contact with one another and are often irregularly polygonal or even spindle shaped, with the signs of activity in the nuclei as definite as those already described. Sections of these tumours and also the following case of duct carcinoma are illustrated in my former paper.[1]

CASE OF DUCT CARCINOMA OF PANCREAS.

(43). A mouse inoculated with 5000 tubercle bacilli, which died after seven and a half months, aged 13 months. The abdomen, which contained 5 c.cm. of ascitic fluid, was distended by a very large spleen on the left and a firm tumour on the right. The tumour is adherent to the liver, stomach, duodenum, pancreas, and right horn of the uterus. A large part of it is composed of a fibroid stroma containing several large irregular cavities, apparently derived from the pancreatic ducts. There are also many irregular alveoli more or less filled with low cubical cells or lining an irregular cavity filled with coagulum. These epithelial elements are found in all parts of the tumour and are reproduced in an enlarged lymph gland lying on the border of the main mass. The alveoli are conspicuous objects in all parts of the tumour

Discussion.

The character of the response to these two bacterial irritants is singularly uniform, and it is the more impressive in the first group when it is remembered that the normal blood count of the mouse appears to be 40 per cent. polymorphs and 60 per cent. lymphocytes. Yet in the mice dead of pseudotuberculosis the infiltrating cells round the pancreas are almost exclusively polymorphonuclear. They are accompanied by enlarged lymph glands and adhesions to adjoining organs and structures. The enlarged glands are all of the one type, consisting largely of cells resembling polymorphs, not very closely packed together, and they often contain large sinuses full of blood. As the infiltrations run into the adhesions lobules of the pancreas often become involved, but the cells remain passive, even when they are smothered with polymorphs. The lobules may be separated by the invading cells and the alveoli disintegrated, but the secreting cells seem to disappear without making any attempt to proliferate.

In mice inoculated with tubercle bacilli the picture is made up of infiltrations, enlarged glands, and adhesions corresponding to those of the former group, so that diagnosis is only possible by the naked eye or a hand lens if the observer can see the little necrotic points of pseudotuberculosis. But with the microscope the two pictures are quite distinct. The tuberculous reaction, instead of separating the cells of the pancreas, causes them to close up their ranks. Many of the cells in adjoining alveoli show two or three large vesicular nuclei, often with confluent cytoplasm. Small isolated cells, recognisable as pancreatic, have the large prominent nucleus, and these nuclei persist even when lobules are pressed into lines of cells by pressure from an adjacent tumour. In consequence of this prompt response the clefts between the lobules disappear and the inoculated mice present all stages of the process until the appearances end in uniform sheets of small dedifferentiated pancreatic cells still retaining their large prominent nuclei.

The numbers of mice dealt with in the foregoing sections are large enough to be significant, and as they are all of one stock a possible source of error is eliminated. As mice are not quickly killed by small doses of tubercle bacilli nor—in this outbreak at least—by pseudotuberculosis, our results may be looked upon as examples of the action of chronic inflammation. The polymorphic exudation ran on towards the formation of fibrous adhesions, which may ultimately cause atrophy of the cells of the pancreas and in some cases of those of the gastric glands also. The lymphocytic inflammation, on the contrary, was accompanied by proliferative changes in the cells of the pancreas and sometimes in those of an adjacent organ.

The action of many agents which may form the basis of a malignant growth in the human body is regularly accompanied by a lymphocytic reaction. Amongst such agents are tar, lubricating oils, burns, lupus, and X rays. On the other hand, a suppurating surface, so long as the pus is polynuclear, seldom becomes malignant. In a former paper I pointed out that the lymphocytic reaction appears to be the connecting link between the tubercle bacillus and malignancy. Other experimental cancers in mice seem to indicate that the overcrowding of the lymphocytes is an essential factor in the process. As these cells consist of a nucleus with very little cytoplasm, an overcrowded area appears to consist of nothing except nuclei. In some of the mice, in section of the marrow or lymph glands, they look like a hexagonal pavement, mutual pressure altering their shape. Such conditions appear ideal for the occurrence of anaerobiosis, which, according to Warburg and his school, is an essential factor in the change to malignancy. Anaerobic autolysis of or autolysis by lymphocytes is a probable source of the growth-stimulating substances, and such substances may act on any cells which they reach and which are ready to react. Pathologists who accept this view account for the unrestricted growth of a cancer by pointing to the facility with which continuous supplies of the stimulus may be derived by anaerobic autolysis of tumour cells which have lost their full vitality. The tumour thus becomes self-supporting. On this hypothesis it is probable that any original focus of lymphocytes will disappear by being replaced by the tumour soon after its growth has become rapid.

Ewing remarks[2] that the process excited by the tubercle bacillus may "progress of its own momentum and gradually acquire neoplastic properties." My interpretation of this sentence would be that the momentum is proportionate to the crowding of lymphocytes in places where anaerobiosis is easy—oxygen starvation being presumably more difficult in the lungs than in the bone-marrow or a lymph gland—and the acquisition of neoplastic properties depends on the supply of growth-stimulating substances coming from an anaerobic mass of cells. The lesions found in the mouse are very suitable for the study of their relationship to one another, because the continuity of lines of cells may be traced in a single section from organ to organ. For example, an infiltration of the retropancreatic fat may be followed through the pancreas to an adhesion and thence through the coats of the stomach into the submucous tissue.

The transference of the data given in this paper to the pathology of human cancer is, to a large extent, a

matter of inference. Such inferences are not improbable in the case of Hodgkin's tumour and in that of lupus changing to carcinoma, but their wider application may be strengthened by a statistical investigation into the incidence of the two diseases.

STATISTICAL STUDIES.

Ninety years ago Walshe,[3] the pathologist to University College Hospital, stated that "tubercle and cancer possess a sort of repulsion in respect of each other." He found only seven cases of active phthisis in 104 autopsies of cancer. This antagonism was emphasised by Rokitansky, of Vienna, in 1854, and thereafter the co-existence of the two diseases was looked upon by most pathologists as the exception which proved the rule. In 1929 Raymond Pearl[4] published the evidence obtained from the records of the Johns Hopkins Hospital and, after providing for a rigid system of controls, he confirmed the findings of the older pathologists, establishing the fact that only 7 per cent. of those dying of cancer had active tubercle, and conversely that those dying of phthisis very seldom had a tumour. On the other hand, evidence of healed or obsolete tubercle was just as common in cancer cases as it was in patients dying of other diseases.

In 1924,[5] from an analysis of the deaths in the occupations at the three census periods, I showed: (1) that the incidence of cancer in nearly all the large occupations in 1911 was proportional to the incidence of phthisis in the same occupations in 1891; (2) that the increase in the deaths from cancer cannot be explained by the increase in the number of men who attain the age of 55. The question of the accuracy of diagnosis is not involved in these results, because the deaths occurred at the one census period and any correction would simply shift all the numbers in the same direction.

In my next paper[6] corresponding results were shown to hold for the whole adult population of England and Wales. After discussing the probable order of the corrections necessary to bring the diagnosis in former periods up to our present standard, it was shown that the combined deaths from phthisis and cancer were always close to one-fifth of the total deaths—except those from accident—after the age of 25. The increase in cancer regularly compensated for the decline in phthisis. In consequence of this relation, the combined mortality-rate has varied only slightly during the past 40 years. From converging lines of evidence I inferred that cancer attacks the moiety of the 20 per cent. of the population which has not died of phthisis. There is good evidence that the great majority of the adult population has been in contact with tubercle bacilli and that opportunities for reinfection are still very common. Hence the following questions require to be answered in the light of experimental work:—

1. Is it possible that tuberculosis and most cancers are manifestations of the same essential condition; the resistance of the body to invasion by the bacillus?
2. May not successful resistance to the bacillus in early life prepare the body to deal with a second invasion by different methods?
3. If acquired resistance to tuberculosis is the usual predisposing cause of cancer, may not the second invasion be the factor which precipitates the crisis in the life-history of the cells of the body?

I regard resistance to tuberculosis as a racial trait, and results obtained from English statistics cannot be applied directly to other people. To take an extreme instance, among the South Sea Islanders tuberculosis is nearly always rapidly fatal. For some reason malignant disease is remarkably rare. The same conditions prevail also among the Australian aborigines. But in races long in contact with tuberculosis the lymphocytes seem to become intent on encompassing the invading bacilli. Sometimes they overshoot the mark, collecting in such dense masses that those in the centre are strangled and an inevitable autolysis thus initiates the fatal series of changes.

SUMMARY.

1. The histological conditions involving the pancreas in 60 mice dying of pseudotuberculosis are compared with those found in 60 mice which had been inoculated with tubercle bacilli and were free from pseudotuberculosis.

2. In the former group there is an exudation of cells, chiefly of the polymorphonuclear type, which may run on to the formation of adhesions to adjoining organs. No sign of proliferation of the secreting cells of the pancreas is found.

3. In the second group the infiltration of the pancreatic area is mainly lymphocytic in character. Proliferation of the secreting cells of the pancreas and signs of activity in the fibroblasts of the adhesions become common. In the 50 mice there are five instances of carcinoma of the pancreas, a condition not hitherto described in this animal.

REFERENCES.

1. Cherry, T.: Med. Jour. Aust., 1929, i., 140.
2. Ewing, J.: THE LANCET, 1928, ii., 140.
3. Walshe, W. H.: Cyclopædia of Surgery, 1840, i., 623; Nature and Treatment of Cancer, London, 1846, p. 185.
4. Pearl, Raymond: Amer. Jour. Hyg., 1929, ix., 97; see also THE LANCET, 1929, i., 1078.
5. Cherry.: Med. Jour. Aust., Oct. 11th, 1924; THE LANCET, 1925, ii., 644.
6. Cherry.: Med. Jour. Aust., June 6th, 1925.

THROMBO-ANGIITIS OBLITERANS IN SIAM.*

BY T. P. NOBLE, M.D., F.R.S. EDIN., F.R.C.S. ENG.,
PROFESSOR OF SURGERY, CHULALONGCHORN UNIVERSITY, BANGKOK, SIAM.

Thrombo-angiitis obliterans may be defined as a chronic thrombosing process involving the main peripheral arteries and veins. In the early stages a soft red clot consisting of erythrocytes and fibrin fills the lumen of the vessels; this clot in time undergoes vascularisation and organisation. Von Winiwarter[1] described the first case of thrombo-angiitis obliterans in 1897, and noted a proliferation of the intima with an inflammatory reaction of the walls of the vessels. Buerger,[2] in 1908, reported a large group of cases in the Jewish race, and to him we owe the first accurate description of the pathological changes and clinical features. Since 1908 many groups of cases have been reported from various parts of the world, including China, Japan, and the Federated Malay States. The original impression that the condition was almost entirely confined to Russian Jews is no longer accepted, for in a large series of cases reported recently from the Mayo Clinic by Brown and Henderson[3] the percentage of Jews was just over 50.

The disease usually affects males between the ages of 25 and 40 years. In the West 90 per cent. of the cases have symptoms referable to the lower extremities. In 30 per cent. there is some degree of arterial obliteration in the upper extremities and in 5 per cent. of the cases the lesions in the hands are the outstanding feature. The symptoms of the disease are as a rule pathognomonic, but often

* Read before the Surgical Section of the Far Eastern Association of Tropical Medicine at Bangkok, Siam, on Dec. 8th, 1930.

erroneously interpreted; the examination for pulsation in the peripheral arteries is frequently neglected and the true nature of the disease is not appreciated until trophic changes or gangrene have actually set in. There is no known specific causative factor, but the pathological changes certainly suggest an infectious basis, and Rabinowitz [4] has isolated an organism with which he has produced vascular lesions in rabbits similar to those found in this disease. His work, however, has not been confirmed by other investigators. Tobacco and exposure to cold are also said to play a part in its causation.

Clinical Features.

By injecting the blood-vessels of amputated limbs which have been the seat of this disease it can be shown that the pathological process involves only the main vessels of the limb and is frequently patchy in its distribution. Small segments of the vessel become closed while other portions remain open, with the result that a collateral circulation develops above the occluded area; later, another segment closes and a further collateral circulation develops. The preservation of the limb will naturally depend upon the efficiency of the collateral circulation. If the segments affected are large and the closure rapid the prognosis is bad, and conversely if the segments affected are small and the closure slow the prognosis is good. If these injected specimens from amputated limbs are X rayed, the collateral circulation is shown to be well developed, in striking contrast to cases of arterio-sclerosis, in which the main arteries to the limb are patent but the collateral circulation is almost completely absent.

The earliest symptom is inflammation of the superficial veins, and to a lesser extent of the deeper veins as well, but unfortunately this only occurs in rather less than 30 per cent. of the cases. The most important of the earliest symptoms is intermittent claudication, which is present at one time or another in the great majority of cases. It is the result of a deficient supply of blood to the muscles; it comes on after exercise and is relieved by rest. Usually it takes the form of a painful cramp but at other times it may amount merely to an abnormal degree of fatigue, without pain. This symptom is soon followed by colour changes in the extremities, marked cyanosis when the feet are dependent, and pallor when they are elevated. Buerger's circulatory efficiency test gives an idea of the extent of the collateral circulation. It consists in noting the rapidity and uniformity of the colour changes of the extremity, first in the dependent position and then after an elevation of 180°. After the disease has progressed a variable time the distal part of the limb becomes intensely red and cyanotic. These colour changes are succeeded by trophic disturbances and acute thromboses in individual toes; later trophic ulcers and gangrene develop and the type of pain now alters. Instead of being intermittent and only during exercise, as in the early phases, it becomes constant and severe, interferes with sleep, and is difficult to control. The disease is generally bilateral and in many cases all the four limbs are affected; if the peripheral vessels are palpated pulsation will be found to be absent or much diminished.

In the hand intermittent claudication is not observed; intermittent pallor and cyanosis are the initial symptoms. The condition rarely leads to gangrene of more than a few fingers. Consequently the disease is much more mutilating in the lower extremities than in the upper extremities, but when the upper limbs are involved persistent pain is a marked feature. The persistent pains, the trophic changes, and the gangrene, which are looked upon by many as the chief features of the disease, are but the final phases, for we know little or nothing of its beginning.

Diagnosis.

Confusion exists in the diagnosis of localised vascular disease for two reasons: firstly, the failure of the physician to examine for peripheral pulsation; and secondly, the erroneous idea that intermittent colour changes only occur in Raynaud's disease and erythromelalgia. In many cases these colour changes —which represent capillary reactions only and not the fundamental disturbances—are due to thrombo-angiitis obliterans, and if more careful examination is carried out it will be noted that the parts—although red in colour—are cold, that the red colour is constant only in the dependent position, and that vascular occlusion is evident. The condition for which this disease is probably most likely to be mistaken is arterio-sclerosis, but the differentiation between the two is generally not difficult. They occur at different periods of life: thrombo-angiitis obliterans between the ages of 25 and 40, arterio-sclerosis from 55 years onwards. Buerger's circulatory efficiency test, intermittent claudication, and absence of pulsation in the peripheral vessels are present in both diseases but the type of rest pain is quite different; in thrombo-angiitis obliterans it is sharp, stinging, and severe; in arterio-sclerosis it is usually mild and aching. In thrombo-angiitis obliterans the ulcers are usually moist, inflamed, and discharging, whereas in arterio-sclerosis they are usually dry. Colour changes, low temperature, and œdema are present in both diseases. The following table, modified from Brown and Henderson's paper on the "Diagnosis and Treatment of Arterial Vascular Disease," brings out very clearly the differential diagnosis of these two diseases.

TABLE I.—*Differential Diagnosis of Vascular Disease Affecting the Extremities.*

(Modified from Brown and Henderson.)

—	Thrombo-angiitis obliterans.	Arterio-sclerotic disease.
Pulsation of arteries	Pulseless, 50 per cent.	Pulseless, 50 per cent.
	Diminished, 45 per cent.	Diminished, 45 per cent.
	Normal, 5 per cent.	Normal, 5 per cent.
Excessive rubor with dependency	Present.	Present.
Excessive pallor with elevation	,,	,,
Claudication	Usually present.	Usually present.
Gangrene	Common.	Common.
Rest pain	Usually very severe.	Usually mild.
Type of rest pain	Sharp stringing.	Aching.
Appearance of gangrenous ulcers	Moist, inflamed, discharging.	Usually dry.
Superficial phlebitis	30 per cent. of cases.	Absent.
Age (years)	Mostly between 25 and 45.	Mostly between 55 and 85.
Sex	Males, 99 per cent.	Males, 90 per cent.
Race	Hebrews, 50 per cent.	Any.
Rontgenogram of arteries	Usually negative for sclerosis.	Usually positive for sclerosis.
Colour changes following exposure to cold	30 per cent.	15 to 20 per cent.
Temperature of extremities	Low.	Low.
Œdema	Frequent.	Infrequent.

Analysis of Cases.

The number of cases in my series (15) is not large but serves to point out the existence of this disease in Siam and how it differs from that seen in western countries. Of the 15 cases 14 were males and one a female; 12 were Siamese and 3 were Chinese, the

female being a Chinese. The age at the onset of symptoms has been noted in each case; the youngest patient of the group was 26 and the oldest 38, while the average age at the onset of the symptoms was 32. The majority of the patients have an outdoor occupation; 6 are farmers, 4 coolies, and 2 outdoor vendors, while a teacher, a civil servant, and a rice-miller

TABLE II.

No.	Nationality and occupation.	Sex and age at onset	Habits.	Limbs affected and duration.	Treatment.
1	Siamese; farmer.	M. 31	Cigarettes.	Both legs, 3½ y. Both arms, 4 m.	Per. symp. both arms; amp. toes.
2	Siamese; vendor.	M. 33	Alcohol, tobacco, opium, Ind. hemp.	Both arms, 4 y. Both legs, 3 y.	Per. symp. both legs; amp. toes.
3	Siamese; farmer.	M. 37	Cigarettes, Ind. hemp.	Both legs, 2 y.	Per. symp.; amp. toes.
4	Chinese; rice-miller.	M. 38	Alcohol, tobacco, opium.	L. leg., 4 y. R. leg, 4 m. both arms, 1 y.	Per. symp. both arms and R. leg. amp. toes.
5	Siamese; Coolie.	M. 38	Cigarettes, Ind. hemp, alcohol.	Both legs and both arms, 3 y.	Per. symp. both legs and arms, amp. toes.
6	Chinese; vendor.	M. 26	Cigarettes.	L. leg, 2 y.	Per. symp. amp. toes.
7	Siamese; farmer.	M. 35	Alcohol, tobacco, Ind. hemp, opium.	L. leg, 5 y.	,,
8*	,,	M. 34	Cigarettes, alcohol, Ind. hemp, opium.	R. leg, 3 y. L. leg, 2½ y. R. arm, 2 m.	Per. symp. both legs; amp. toes and fingers.
9	Siamese; gardener.	M. 27	Cigarettes.	Both legs, 4 y. Both arms, 3 y.	Per. symp. both arms and legs. Amp. toes and fingers.
10	Siamese; farmer.	M. 26	Cigarettes.	R. leg, 4 y.	Per. symp. amp. toes.
11	Siamese; civil servant	M. 32	Cigarettes, alcohol, Ind. hemp, opium.	Both legs, 5 y.	Amp. below knee, L. leg.
12	Siamese; dom. servt.	F. 34	Betel-nut.	L. arm, 6 y. R. arm, 2 m.	Medical measures.
13	,,	M. 36	Tobacco, opium.	Both legs, 2 y. Both arms, 2 m.	,,
14	,,	M. 26	Tobacco, alcohol.	Both legs, 3½ y. Both arms, indefinite.	Per. symp. both legs.
15	Chinese; teacher.	M. 30	Tobacco.	Both legs, 3 y. Both arms, 3 m.	Per. symp. both legs and arms.

* *Case 8.*—Wassermann reaction, + + + ; in all other cases it was negative. y = years; m. = months. Per. symp. = peri-arterial sympathectomy; amp. = amputation.

account for one each. This does not necessarily mean exposure, as the climate of Bangkok reaches a maximum of 100° F. to 104° F. each year during the hot season and about 95° F. at some time or other during almost every month of the other seasons. During the hot rainy season, March to October, the temperature rarely falls below 80° F., and during the so-called cool season, October to February, the temperature rarely falls below 60° F. These patients go about without shoes and subject their feet to minor traumata which sooner or later precipitate the onset of gangrene. All except one in this series are heavy cigarette-smokers; the one exception is the female patient, and she habitually chews betel-nut. In addition to smoking cigarettes, six of them habitually smoke opium, six take Indian hemp, and six alcohol in excessive quantities. A number take all three drugs, opium, Indian hemp, and alcohol. These drugs were taken for the relief of pain in the first instance; as the pain increased in severity the dose was correspondingly increased. The Siamese, and particularly the Chinese, have less appreciation of pain than the European, so that in many cases the taking of opium and Indian hemp relieves the pain sufficiently, and if it is taken over a sufficiently long period it enables a natural cure to take place without any other form of treatment.

The disease may affect one limb only and undergo a natural cure, or two legs or two arms may be affected, but generally one before the other. On the other hand, one leg may be affected, then both arms followed by the remaining leg, the disease in that way being spread over a period of four or five years; in other cases all four limbs may be affected simultaneously. The duration of the disease depends on the rate of development of the collateral circulation; it may be more than five years before a natural cure takes place, even with the aid of drugs, physiotherapy, and periarterial sympathectomy. Of the 15 cases, eight had all four limbs affected, one had three limbs, three cases two limbs, and three cases one limb. The average duration of the disease before coming for treatment in the eight cases where all four limbs were affected was 3 to 4 years; in the cases with three limbs affected, 3 years, two limbs 4·3 years, and one limb 3·9 years, so that the length of time appears to have no bearing on the number of limbs affected. The Wassermann reaction was negative in all except one case, and that was probably incidental.

The surgical procedures carried out have been confined to periarterial sympathectomy and amputation of fingers and toes. Only in one case was a major amputation performed and that was at the junction of the upper and middle thirds of the tibia; a small part of the tip of the anterior flap necrosed, but otherwise it healed satisfactorily. These operations are much less mutilating than the major amputations performed for this disease in western countries. In one case the dorsal interosseous artery in the right forearm was distinctly palpable and had taken the place of the right radial, illustrating again that in thrombo-angiitis obliterans only the main arterial trunk of the limb is closed, the other vessels being more or less normal—in contrast to arterio-sclerosis where the main arteries of the limb are patent but the collateral circulation is absent.

Treatment.

Unfortunately there is no specific treatment for the inflammatory process, but if the disease is diagnosed early and careful prophylactic treatment instituted to diminish the functional demands on the local circulation, much can be done to relieve the sufferings of the patient and limit the spread of the gangrenous process. The circulation can be improved by the intravenous injection of foreign proteins, radium chloride, sodium citrate, or Ringer's solution, combined with application to the extremities of hot-air baths and diathermy. The patient should also be instructed in the avoidance of minor traumata to the extremities, the protection of the toes, and the treatment of any local condition which may develop.

By periarterial sympathectomy the circulation will be further improved and the pain further relieved. In Buerger's disease pain dominates the situation much more than does gangrene, and time that is free from suffering is time gained. During this interval of freedom a collateral circulation is gradually developing which will either render an amputation unnecessary or enable it to be done at a lower level. The operation of periarterial sympathectomy came into prominence through the work of Leriche, who in 1913 published an article on the removal and resection of the perivascular nerves for the relief of painful syndromes of arterial origin. Nerve-endings have been demonstrated

by Woollard in the walls of the blood-vessels; from this point of origin the fibres, after a variable course of which the length is unknown, leave the vessel and join the neighbouring spinal nerve, but some remain to the artery and run along it throughout their whole course—in the case of the lower limb—right up to the lumbar ganglionated cord. Arteries are undoubtedly sensitive; this can be demonstrated both clinically and experimentally. They are sensitive not only to traumata but also to inflammation and the lessening of the blood-supply to their own walls. The object of periarterial sympathectomy is to divide the afferent and efferent sympathetic fibres and thereby abolish vaso-constrictor control over the whole of that portion of the vessel which is distal to the point of division, as well as to abolish the pain. In practically all cases the effects of the operation are an initial vaso-constriction, which is probably due to local trauma, followed very soon afterwards by vaso-dilatation, a rise in the temperature of the limb, and relief of pain. Periarterial sympathectomy relieves pain and on that ground alone justifies its performance in thrombo-angiitis obliterans.

The treatment formerly advised was early and high amputation, because of the patient's inability to endure pain but conservative measures, if carried out for long periods, will prevent the development of gangrene and most of the major amputations. There is a stage in this disease of acute or subacute vascular insufficiency, and if the patient can be carried past that stage without gangrene developing, sufficient collateral circulation will usually be established to leave the extremity adequately supplied with blood. In this series only one had a major amputation, and others had amputations of digits only. In thrombo-angiitis obliterans we are dealing with a process the striking feature of which is a collateral circulation, in contrast to arterio-sclerosis where the collateral blood-supply is poor. This further bears out the well-known fact that amputation below the knee is rarely satisfactory in arterio-sclerosis, whereas in thrombo-angiitis obliterans minor amputations are the rule and are successful in the great majority of instances.

Conclusions.

1. Thrombo-angiitis obliterans has a universal distribution; in all probability it is as common in the East as in the West.

2. In the East it appears to be of a milder type than in the West.

3. Major amputations are now rarely necessary; operative treatment, apart from sympathectomy, is almost entirely confined to removal of fingers and toes.

4. The relief from pain by periarterial sympathectomy is very striking; it gives time for a collateral circulation to develop.

5. Confusion exists in the diagnosis of localised vascular disease because of the failure on the part of the physician to examine for peripheral pulsation and to the erroneous idea that colour-changes in a limb must be due to Raynaud's disease or erythromyelalgia, whereas in many cases these changes are due to thrombo-angiitis obliterans.

BIBLIOGRAPHY.

1. Winiwarter, F. von: Arch. klin. Chir., 1879, xxiii., 202.
2. Buerger, Leo: The Circulatory Disturbances of the Extremities, Philadelphia, 1924.
3. Brown, G. E., and Henderson, M. S.: Jour. Bone and Joint Surg., 1927, ix., 613.
4. Rabinowitz, H. M.: Surg., Gyn., and Obst., 1923, xxxvii., 353.
5. Horton, B. T.: Proc. Staff Meeting Mayo Clinic, 1928, iii., 144.
6. Woollard, H. H.: Heart, 1926, xiii., 319.
7. Leriche, René: Lyon Chir., 1913, x., 378.

INFLUENZAL MENINGITIS.

WITH A REPORT OF TWO CASES.

By John Gibbens, M.B. Camb., M.R.C.P. Lond.,

PHYSICIAN IN CHARGE OF THE CHILDREN'S DEPARTMENT, ST. JOHN'S HOSPITAL, LEWISHAM; CHIEF ASSISTANT TO THE CHILDREN'S DEPARTMENT, ST. THOMAS'S HOSPITAL.

My justification for publishing these two cases of influenzal meningitis is not so much the rarity of this condition and the lack of recent reports on the subject as the fact that the second case recovered completely; from a survey of the literature this appears to be the third case only of recovery on record in this country.

The term "influenzal meningitis" is taken to mean a meningitis produced by Pfeiffer's bacillus or some allied bacillus of the influenza group; it does not include cases of meningitis which occur during epidemics of influenza. In point of fact, during the great influenza epidemics meningitis is quite exceptional. Levin,[1] in 816 cases of influenza in children, had only five cases of meningitis; of these none was due to the influenza bacillus. The majority of cases showed post mortem merely some hyperæmia of the cortex and meninges, while a few were frank cases of pneumococcal or streptococcal meningitis complicating influenza.

The influenza bacillus was described by Pfeiffer in 1892, and in the same year Pfuhl,[2] in Germany, described the first cases of meningitis due to this organism. Since then various authors have published isolated case reports, and in 1922 Rivers[3] was able to collect from the literature some 220 cases with a mortality-rate of 92 per cent. Thirteen cases—two of them in this country—had recovered completely, and an additional four cases had recovered partially, being left with the following sequelæ: (1) residual left facial paralysis and a left hemiplegia; (2) partial blindness; (3) partial blindness, bilateral papilloedema, and a paresis of the left oculomotor nerve; (4) complete nerve deafness. One of the cases reported below recovered completely and is perfectly well now, three months after the illness.

INCUBATION PERIOD AND AGE-INCIDENCE.

Davis[4] saw twins aged 5 days with signs of meningitis. One died on the ninth and one on the twelfth day, and at autopsy the first child had a definite influenzal meningitis; post-mortem examination was not allowed on the other. This would put the incubation period at not more than five days. So few cases have been seen that it is impossible to imagine the spread of the disease by contact, and there is at present no evidence of spread by carriers.

Influenzal meningitis is almost entirely a disease of infancy and early childhood. Of the 220 cases reported up to 1922, no less than 152 were under 2 years of age.

CLINICAL SYMPTOMS.

There are two main groups of cases: (*a*) influenzal meningitis; and (*b*) influenzal meningitis with joint involvement. Of the two, the former is, undoubtedly, the commoner.

(*a*) *Influenzal Meningitis.*—Good descriptions were given by Batten[5] in 1910 of this type of case. The onset is usually sudden, the child appearing previously to be in excellent health. He begins to vomit and on examination is found to have some stiffness of the neck, perhaps amounting to slight head retraction, and a moderate fever; Kernig's sign may be positive, but usually there is little rigidity and no paralysis,

and the optic discs and pupils are normal. On lumbar puncture the cerebro-spinal fluid is under moderately increased pressure and is turbid, and microscopically shows pus cells and Pfeiffer's bacillus. The course is downhill, frank meningeal signs making their appearance later. The child gets progressively more drowsy and begins to twitch; finally, death occurs with fits or hyperpyrexia, usually within three weeks, though cases have been reported that survived as long as 60 days from the onset.

(*b*) *Influenzal Meningitis with Joint Involvement.*—Recently several cases of this condition, which is almost entirely limited to young babies, have been described by Dudgeon and Adams,[6] Nabarro and Stallman,[7] Kristensen and Christensen,[8] and Richardiére and Laplane.[9] Signs of a suppurative arthritis, usually of the knee or elbow, follow an attack of influenza, and aspiration of the joint reveals thick greenish pus containing Pfeiffer's bacillus. Meningeal signs appear in some cases whether aspiration is performed or not, and the child dies; in others incision and irrigation of the affected joint is followed by a perfect functional recovery and signs of meningitis never develop. In the majority of cases the arthritis is apparently primary; a few cases show at operation an actual influenzal osteomyelitis with secondary involvement of the joint (Zweig,[10] Leichentritt and Schober[11]). In Dudgeon and Adams's case Pfeiffer's bacillus was cultured from the joint, brain, and spleen post mortem, and, although they could not be cultured, bacilli could be seen in sections of the lung.

LABORATORY TESTS.

1. *Cerebro-spinal Fluid.*—This is usually cloudy and contains abundant polymorphonuclear cells. In some cases lymphocytes may be numerous—up to 30 or 40 per cent. Pfeiffer's bacillus can be seen in a stained fresh specimen as a minute pleomorphic Gram-negative organism, and pure cultures can generally be obtained on blood-agar. Some strains are hæmolytic and some are not. Several authors, as for instance Braxton Hicks,[12] have raised a doubt whether these organisms that are found in influenzal meningitis are true *B. influenzæ*. The true *B. influenzæ* has as two of its main characteristics that: (1) it is practically innocuous to animals, and (2) it is readily grown in suitable media. Organisms from cases of influenzal meningitis, however, are often very pathogenic to animals and in many cases are difficult to grow in pure culture. Probably the environment of the bacillus alters its virulence, for Anderson and Schultz,[13] in a case of influenzal meningitis, were able to isolate five different strains of influenza bacillus from the spinal fluid, blood, throat, nose, and nasopharynx respectively; immunological reactions showed no relations between the strains.

2. *The Blood.*—A blood count shows, as a rule, moderate leucocytosis. Blood cultures have been positive in many cases; Rivers,[3] in 23 cases, had eight positive results, and positive blood cultures have been reported by others (Wollstein,[14] Buchholz[15]).

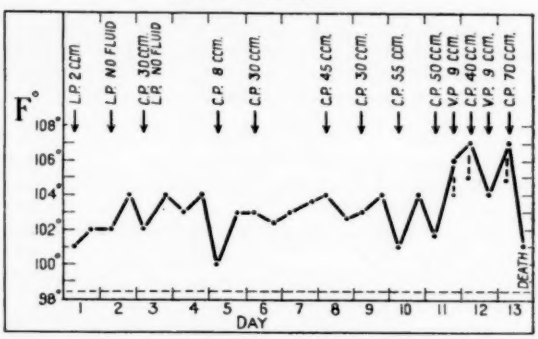
Case Reports.

CASE 1, a boy aged 1 year, was admitted on Jan. 9th, 1930. On Dec. 26th the baby suddenly started vomiting for no apparent reason and continued to vomit forcibly for the next three days. In addition he cried continuously and rolled his head from side to side now and again, but had no convulsions. Both parents were perfectly well; nobody in the house and nobody who had recently been with him had any obvious respiratory infection. The child was brought up to the hospital on Dec. 31st, but no signs of disease were discovered, and he was sent away with a diagnosis of teething, and given small doses of chloral. Two days later, on attending again, the mother said she thought the child was rather better, so the diagnosis of teething was regarded as certain and she was asked to bring him up again in a week's time. Next time, however, she thought the child was worse. On examination the general condition was bad; there was marked pallor and he really looked ill. There was definite bulging of the fontanelle, but no stiff neck and Kernig's sign was negative. He was admitted at once.

When I examined him he was pale, feverish, and obviously ill; there was no general body wasting—on the contrary, he was fat and well covered, although the tone of the muscles was much diminished. There was marked bulging of the fontanelle but no neck rigidity or Kernig's sign, and the cranial nerves, optic discs, and all reflexes were normal. There were no signs of disease in the abdomen, chest, or throat. On lumbar puncture only 2 c.cm. of thick turbid fluid were removed, not under increased pressure. Next day the pathologist reported that a direct smear from the fluid contained many pus cells and influenza bacilli; the bacilli, however, could not be cultured even on repeated attempts. (Cultures on blood agar were obtained later in the course of the disease.) The blood showed a moderate leucocytosis; lumbar puncture was done again, but this time, even after two or three trials, no fluid could be obtained.

The child's general condition next day (Jan. 11th) was about the same. In view of the marked bulging and the fact that another lumbar puncture failed, cisternal puncture was done and 30 c.cm. of turbid fluid under increased pressure removed. Immediately after cisternal puncture the fontanelle was less tense but within 12 hours it was bulging as much as before. During the next week (Jan. 11th–Jan. 18th) the general condition remained unaltered. There were no more meningeal signs and no more vomiting. The fontanelle remained tense and bulging. Cisternal puncture was done on five days, removing 8 c.cm., 30 c.cm., 45 c.cm., 30 c.cm., and 55 c.cm. of turbid fluid, which became progressively clearer, with fewer pus cells and bacilli. At this stage it seemed possible that the child might recover. However, next day (Jan. 19th) he was obviously worse and beginning to get drowsy, but had no convulsions or twitchings. Right ventricular puncture was done, but as it removed only 9 c.cm. of fluid it was followed by cisternal puncture, removing 50 c.cm., but there was no improvement. Next day (Jan. 20th) left venticular puncture, removing 9 c.cm., and cisternal puncture (40 c.cm.) were done, and on

FIG. 1 (Case 1).



Temperature chart after admission to hospital. L.P. = lumbar puncture. C.P. = cisternal puncture. V.P. = ventricular puncture.

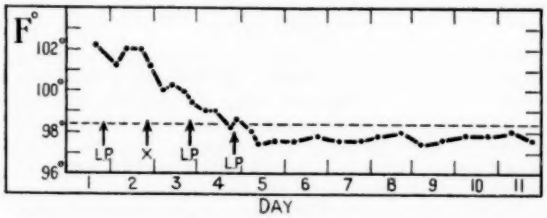
Jan. 21st a further cisternal puncture, removing 70 c.cm. but coma increased and the child died. Apart from drainage of the cerebro-spinal fluid treatment was purely symptomatic.

Post-mortem Examination.—The entire vertex of the brain was plastered over with a thick adherent layer of yellowish pus, obliterating the sulci and convolutions. The right ventricle contained pus, and the left ventricle contained pus with a large recent blood-clot; there was marked vascular engorgement of the brain. A careful dissection was made of the tissues at the back of the neck down to the dura; all the marks of the cisternal punctures could be seen, closely grouped together. On the internal surface of the dura, round one or two of the puncture marks, there were small adherent blood-clots. The medulla, macroscopically, showed no evidence of trauma from the cisternal punctures. No pus was found in the mastoid or in the sphenoid, ethmoid, or maxillary sinuses, and cultures for the influenza bacillus were negative. Beyond some fatty degeneration in the liver, no changes were found in other organs; the lungs and tonsils were entirely normal. (Chart 1.)

Here we have a case of influenzal meningitis with no apparent previous influenza. At least 14 days elapsed before a definite diagnosis was made, and two more before drainage of the cerebro-spinal fluid was commenced. It was obvious at autopsy that the drainage of the cisterna magna had been entirely futile; we had merely removed supernatant fluid and left the pus adherent to the brain. It was interesting to see the result of repeated cisternal punctures; these were always carried out under slight ether anæsthesia and were easy enough to do, and the post-mortem examination demonstrated the accuracy of the procedure and its very slight traumatism.

CASE 2, a boy aged 5, was seen in consultation with Mr. E. Hesketh Roberts on May 1st, 1930. He was first seen by Mr. Roberts on April 23rd, when there was an inflammatory swelling of one parotid, exactly like mumps of three days' duration. Two days later this had subsided. On May 1st at midday he began to vomit, after which he had no food. On sitting the boy up to auscultate the back of his chest it was noticed that he had a slight but definite stiff neck; Kernig's sign was doubtfully positive. No other signs of disease were found in the central nervous system or other system; the urine was full of acetone. Large doses of alkalis were given, and also glucose.

FIG. 2 (Case 2).



Temperature chart from May 1st. L.P. = lumbar puncture. At (X) 5 c.cm. of antimeningococcal serum were given intraspinally and 25 c.cm. intravenously.

When seen by me on May 1st at 9 P.M., there was a definite stiff neck, also inability to sit up owing to discomfort along the spine. All the reflexes, cranial nerves, and the optic discs were normal. There were no signs of disease in the abdomen, chest, or throat; and no parotid swelling, and both ear drums were normal. Lumbar puncture was done immediately and 10 c.cm. of turbid fluid under slightly increased pressure were removed. A provisional diagnosis of meningococcal meningitis was made and next day, after lumbar puncture (8 c.cm.), 5 c.cm. of antimeningococcal serum (Burroughs Wellcome) were given intraspinally and 25 c.cm. (Mulford) intravenously. The clinical condition was at this time unchanged. Meanwhile the cerebro-spinal fluid had been examined and the pathologist reported large numbers of polymorphonuclear cells and abundant influenza bacilli in a stained smear.

Next day (May 3rd) cultures were taken from the blood, nasopharynx, and urine, but no influenza bacilli were found. Lumbar puncture was again performed and 12 c.cm. of fluid were removed, definitely less turbid and containing fewer pus cells and organisms. There was no headache and the stiff neck was less marked. The following day, May 4th, the boy was free from symptoms, but the cerebro-spinal fluid was still slightly turbid although no organisms could now be seen on culture. The boy was kept in bed for two weeks, but no further symptoms or signs of meningitis occurred. The neck rigidity and Kernig's sign gradually disappeared in the first week, and the temperature remained normal. He is now (August 1st) perfectly well. (Chart 2.)

The mortality of influenzal meningitis is 92 per cent. and one wonders why this second child recovered. Most probably an important factor was the early draining of the infected cerebro-spinal fluid. In the first case the cerebro-spinal fluid had been infected for at least 15 days; any good result from cisternal or lumbar puncture was then hardly to be expected. A review of the literature shows that few cases have had lumbar puncture as early as ten hours after the apparent onset of meningeal signs, as in Case 2; usually three or four days have elapsed since the onset. It is unlikely that the early administration of antimeningococcal serum aided in the recovery; in Richardière and Laplane's case,[9] aged 7, 20 c.cm. of antimeningococcal serum intraspinally and 10 c.cm. intramuscularly were given on the second day and continued daily for 16 days, but later a suppurative arthritis occurred, a positive blood culture was obtained, and the child died. It is obvious from the very slight symptoms shown by my second case that cases of influenzal meningitis may be quite frequent, undiagnosed, and recovering without treatment.

Treatment by Vaccine.

Most authors recommend repeated lumbar or cisternal punctures, possibly with the administration of hexamine, but it cannot be said that this line of treatment has met with any success. Recently, Marie and Pretet[16] described a case, age 1 year and 8 months, in which a cure followed the intraspinal administration of a vaccine prepared from a fatal case of influenzal meningitis.

There was a history of one day's fever and vomiting; on admission the temperature was 104° F. and there was a marked stiff neck, opisthotonos, marked Kernig's sign, and hyperæsthesia. There were no other signs of disease in the central nervous system and all other systems were normal. Lumbar puncture showed cloudy fluid, containing many polymorphs and a few scanty bacilli; a culture on blood agar proved these to be Pfeiffer's bacilli. A hopeless prognosis was given and the child was left alone for 14 days, during which time the temperature was persistently between 102°–103°. The condition of the child remained unchanged. At this point 1 c.cm. of the anti-Pfeiffer vaccine prepared from a fatal case of influenzal meningitis was injected intraspinally, and next day for the first time the temperature dropped to normal. There were no symptoms of shock. During the next two days the child had no fever, and 1 c.cm. of vaccine was given daily subcutaneously; the next day, however, the child's temperature again rose, so three more injections were given intraspinally at daily intervals. The sign of meningitis became much less marked, and in a week the child appeared perfectly well. Ultimately there was complete recovery.

In Case 2 treatment on these lines had been considered, but the child was obviously improving consistently all the time, so no vaccine had to be given.

In conclusion, I should like to thank Mr. E. Hesketh Roberts for permission to publish his case; also Dr. R. Ralph, of St. John's Hospital, for the pathological investigations.

REFERENCES.

1. Levin, I. M.: Internat. Clinics, 1920, ii., 64.
2. Pfuhl, A.: Berl. klin. Woch., 1892, xxix., 979.
3. Rivers, T. M.: Amer. Jour. Dis. Child., 1922, xxiv., 102.
4. Davis, D. J.: Arch. Int. Med., 1909, iv., 323.
5. Batten, F. E.: THE LANCET, 1910, i., 1677.
6. Dudgeon, L. S., and Adams, J. E.: THE LANCET, 1907, ii., 684.
7. Nabarro, D., and Stallman, J. F. H.: THE LANCET, 1924 ii., 743.
8. Kristensen, M., and Christensen, S.: Acta Med. Scand., 1924, lx., 1.
9. Richardière and Laplane: Bull. Soc. Péd. de Paris, 1921, xix., 208.
10. Zweig, H.: Monat. f. Kinderh., 1923, xxvi., 308.
11. Leichtentritt, B., and Schober, W.: Klin. Woch., 1924, xxiii., 1029.
12. Hicks, Braxton: THE LANCET, 1927, ii., 497.
13. Anderson, R. A., and Schultz, O. T.: Jour. Exp. Med., 1921, xxxiii., 653.
14. Wollstein, M.: Amer. Jour. Dis. Child., 1911, i., 42.
15. Buchholz, L.: Monat. f. Kinderh., 1927, xxxv., 31.
16. Marie, J., and Pretet: Bull. Soc. Péd. de Paris., 1927 xxv., 427.

THE NEW FREEMASONS' HOSPITAL.—At the annual meeting last week it was stated that the area available for the new hospital at Ravenscourt Park, Hammersmith, has been increased to five and a half acres and that the new building will hold 180 patients. The response to the appeal for £250,000 has, so far, been £218,000, but in consequence of the enlargement of the plans at least £350,000 will be wanted for the new building.

PLEURAL FLUIDS COMPLICATING INTRATHORACIC NEW GROWTHS.

By S. Roodhouse Gloyne, M.D. Leeds, D.P.H.,
PATHOLOGIST TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, VICTORIA PARK.

Accumulation of fluid in the pleural cavity is a common complication of intrathoracic tumour. Sometimes it occurs late in the course of the disease when the diagnosis has become obvious; at other times it arises in the early stages covering up the lung lesion and obscuring the diagnosis. It frequently recurs after paracentesis, but occasionally it may clear up presumably as a result of occlusion of the pleural cavity by growth, and it may then be a confusing sign difficult to harmonise with the clinical picture.

Autopsy Records.

In 131 autopsies on intrathoracic malignant disease at Victoria Park between the years 1911 and 1930, fluid was found in 56 instances. The following types of fluid were encountered.

SEROUS FLUIDS.

Sterile Effusions.—Sixteen sterile clear fluids were found in cases in which no naked-eye lesions were noted in the pleura itself. Of these, nine were on the same side as the pulmonary growth (six on the right side and three on the left) and four were on the side opposite to that of the growth, whilst three were bilateral.

Effusions with Secondary Deposits in the Pleura.—There were ten examples, of which four were on the right side and six were on the left.

Localised Effusions.—Only one instance of a localised collection of fluid occurred. It was a small serous effusion in the region of the fifth, sixth, and seventh costochondral junctions, the rest of the pleural sac being closed with adhesions. There were secondary deposits in the other pleural sac, but none was found on the same side as the fluid.

Clear Effusions with Secondary Bronchiectasis.—Three cases were noted of a malignant growth giving rise to secondary bronchiectasis and complicated by a serous exudate into the pleural sac.

Clear Fluids Secondarily Infected.—There were three cases of serous effusions in which bacteriological examinations during life showed organisms on culture. The first showed streptococci and fusiform bacilli, and it was evident at the autopsy that the exudate was the result of an underlying terminal gangrene of the lung. In the second and third cases the organisms were probably staphylococcal contaminations.

Effusions containing Tubercle Bacilli.—It is not very uncommon to find pulmonary tuberculosis and malignant disease in the same lung, but it is less common to find a serous effusion containing tubercle bacilli as a complication of new growth. Two cases were noted in the series, one in which the patient had in the right lower lobe both a squamous-celled carcinoma and a cavity suggestive of tuberculosis. The left pleural cavity contained half a pint of turbid fluid in which tubercle bacilli had been demonstrated during life. The other case was also one of carcinoma of the right lower lobe with a tuberculous cavity above. A clear effusion containing tubercle bacilli was removed by exploration on two occasions during life. At the autopsy the fluid was found to have been absorbed and become replaced by adhesions and new growth.

Effusions Subsequently Replaced by Adhesions and Growth.—In addition to the case quoted above there was another instance of a patient who had had, in the earlier stages of the illness, an exudate into the left pleural sac which was drained by paracentesis. Three subsequent explorations failed to find fluid. At the autopsy the sac was found to be adherent, and a mediastinal tumour to have invaded the pleura. This finding seems to be worth recording, because it is sometimes stated that the absorption of a pleural effusion negatives a diagnosis of new growth. Another instance of this occurrence is recorded in the group of effusions with secondary deposits in the pleura, making three in all in this series.

Effusions Possibly Related to Treatment.—Two cases occurred in which effusion was associated with (*a*) artificial pneumothorax, and (*b*) the insertion of radon needles. The first was a case of effusion found, at autopsy, five days after the insertion of radon needles, and the second an effusion after combined pneumothorax and radon treatment. The occurrence of these effusions may, however, be pure coincidence.

PURULENT FLUIDS.

Empyema.—Eleven cases of empyema occurred in this series. In five there was secondary bronchiectasis in the malignant lung. A sixth was an instance of interlobar empyema, and a seventh an empyema secondary to a subphrenic abscess. The empyema in this case was divided into two separate cavities by means of a sheet of adhesions.

Pyopneumothorax.—Two cases of pyopneumothorax were found. The first was a patient who had been admitted with a hydropneumothorax which subsequently turned to streptococcal pus and was drained by open operation. The pyopneumothorax was confined to the upper half of the right sac and the collapsed upper lobe showed no naked-eye growth. A mediastinal growth radiated out in the right lower and middle lobes. It was not clear how the pneumothorax had been produced. The second was a case of carcinoma of the right bronchus with some emphysematous bullæ in the left upper lobe, one or other of which had presumably ruptured, giving rise to a pyopneumothorax containing *Bacillus influenzæ*.

Pus from Bronchiectatic Cavities.—Bronchiectasis is a common complication of malignant disease of the lung, especially in cases in which there is involvement of the bronchus with growth. If the bronchiectatic cavity be of considerable size the exploring needle may enter it and withdraw pus, which gives rise to the belief that an empyema is present. In this series there were five such instances. In four of them a rib resection operation had been done and the wound had failed to heal.

Summary and Discussion.

(1) In this series there were 56 cases (43 per cent.) of pleural fluids of various types occurring in a total of 131 intrathoracic tumours. (2) Thirty-eight (68 per cent.) were clear effusions, and 18 (32 per cent.) were purulent—approximately 3 to 1. At the post-mortem examination several of the serous fluids were bloodstained, but no case of hæmothorax was found. (3) Of the 38 serous fluids 10 occurred with secondary deposits in the pleura, and probably resulted from these deposits. Four appeared to result from underlying sepsis (three bronchiectasis and one gangrene of lung). The remainder may possibly be accounted for in one of two ways—viz., either there were minute subpleural deposits of growth not visible to the naked eye, or pressure of the growth in the mediastinum

caused interference with lymphatic drainage or venous return. (4) Two serous effusions had contained tubercle bacilli during life. Pulmonary tuberculosis and intrathoracic new growth occurring in the same lung are not uncommon. (5) Three instances occurred of serous effusions which became absorbed with advancing new growth occluding the pleural sac. At first sight it may seem unlikely that absorption of fluid can take place through a visceral pleura studded with growth, but it is probable that the absorption is effected through the parietal pleura. (6) It is rather surprising that with the many possibilities of venous and lymphatic obstruction secondary infection of serous fluids was not commoner. (7) Of the 18 purulent fluids five consisted of pus from bronchiectatic cavities, two were instances of pyopneumothorax, and 11 were empyemata (five resulting from underlying sepsis in the lung, and one following subphrenic abscess). The danger of confusing a bronchiectatic cavity with empyema in these cases is evidently considerable.

I am indebted to the medical staff of the Victoria Park Hospital for the clinical notes quoted in this paper, and to Dr. D. S. Page for some of the post-mortem examinations.

CLINICAL AND LABORATORY NOTES

PURPURA HÆMORRHAGICA COMPLICATING SCARLET FEVER.

RECOVERY AFTER THE USE OF LIVER EXTRACT.

BY CHARLES R. BOX, M.D., F.R.C.P. LOND., F.R.C.S. ENG.,
SENIOR PHYSICIAN TO THE LONDON FEVER HOSPITAL;
AND
RICHARD MASSINGHAM, M.R.C.S. ENG.,
RESIDENT MEDICAL OFFICER AT THE HOSPITAL.

HÆMORRHAGIC complications during scarlet fever are fortunately very rare. References to them in the current medical text-books are brief or absent, and are often coupled with the statement that some of the instances recorded may have been cases of purpura variolosa (hæmorrhagic small-pox). Clinicians who have encountered such cases are impressed by their malignant and rapidly lethal character.

In most of the few cases which are recorded ecchymoses have developed on the extremities without implication of the mucous membranes, and death has ensued in a day or two (purpura fulminans). In a few free bleeding from the mucous membranes, as well as into the skin, has occurred (purpura hæmorrhagica). The case now recorded is of the latter type.

A lad of 10 years was admitted to the London Fever Hospital on the thirteenth day of scarlet fever owing to the supervention of purpuric complications. The disease had been uneventful until the tenth day, and the lad had been nursed at home. Corroborative evidence of the nature of his illness is afforded by the fact that his mother and sister contracted the disease shortly afterwards. No family history of purpura or bleeding could be obtained. Petechiæ had been noticed on the abdomen on the tenth day of disease, and on the next day had spread all over the body, including the buccal mucous membrane. On the twelfth day epistaxis was profuse and the urine bloody. Red blood was vomited and, later, melæna and abdominal colic were observed.

On admission the boy was pallid and very restless. The lips were cyanosed. The pulse was rapid (130) and small, the respirations hurried (30), and the temperature but moderately raised (99·4°). A profuse purpuric eruption covered the trunk, limbs, and face. The lesions were of all sizes, some petechial but most larger, a few attaining a diameter of nearly 3 cm. On the right upper arm was a large bruise surrounding a needle puncture. Most of the purpuric spots were dusky purple, some were brighter, and evidently more recent. A few small hæmorrhagic lesions were present on the mucous membrane of the cheeks and tongue. Blood oozed from the nose and posterior nasopharynx. Vomiting, although frequent earlier in the day, had ceased. Melæna was observed, and the urine passed appeared to consist almost entirely of bright blood. The spleen was indistinctly felt on deep inspiration. The fauces were free from obvious inflammation. Neither the submandibular nor other lymph glands were enlarged, and no lesions were detected in the lungs or heart. Hæmoplastin and collosol calcium had been administered before the boy was brought to hospital.

The condition was so critical on the evening of admission that the advisability of immediate blood transfusion was considered, but this was postponed while a trial was made of the free administration of liver extract. This was obtained at once, and a quantity equivalent to a pound a day was administered and continued for a fortnight; afterwards the quantity was reduced to half this amount for five days more. Within 12 hours there was an obvious amelioration of the hæmorrhagic symptoms. The epistaxis slowly ceased, and after 48 hours there was no hæmaturia. A few fresh purpuric spots appeared for one day, and then no more. The purpuric rash and the ecchymoses slowly faded. There was no fever after the night of admission, and the pulse- and respiration-rates slowly fell to normal. After an isolation of six weeks from the commencement of the scarlet fever the boy was discharged, apparently in perfect health.

Date in 1930.	Red cells (millions).	Hb.	C.I.	Platelets.	White cells.	Polymorphs.	Lympho-cytes.	Monocytes.	Myelocytes.	Eosinophils.	Basophils.
		%				%	%	%	%	%	%
Sept. 18..	3,900	80	1	—	80,400	88	9·5*	—	0·5	—	—
,, 19..	3,350	65	1	0 in 4000 cells.	39,800	81·5	14	2	2·5	—	—
,, 26..	2,960	65	1·1	47,300	17,800	49	38	5	—	8	†
Oct. 3..	3,680	80	1·1	93,840	8,600	34	56	6	—	4	†
,, 22..	4,032	80	1	380,800	13,500	45	43	2	—	8	2

* 3 per cent. large and 6·5 per cent. small; also hyaline cells 2 per cent.

† Punctate basophilia observed.

Successive blood counts are shown in the Table. The first count was made by Dr. H. L. Tidy, who saw the boy before admission. The subsequent examinations were by Dr. A. G. Signy, of the Hospital for Sick Children, Great Ormond-street.

The most striking features of the early counts are the heavy polynuclear leucocytosis, the thrombocytopenia, and the absence of eosinophil cells. In the short time which elapsed between the first and the second blood count the number of white cells was halved, but the polynuclear excess persisted. Under treatment the platelets showed an early and rapid increase, the eosinophils reappeared, and the polynuclears gradually diminished in numbers.

COMMENTARY.

There is now plenty of evidence that the administration of liver causes a rapid and progressive increase in the number of blood platelets; indeed it appears to be the most efficient means in this direction which

we possess, superior even in its results to blood transfusion. The absence of eosinophil cells in scarlet fever is said to be a characteristic of fatal cases; ordinarily the disease is unique among other acute infective fevers in that it shows an increasing eosinophilia after the onset.

The polymorphonuclear leucocytosis, which reached 88 per cent., is probably of great significance. The leucocytosis of scarlet fever is of polymorphonuclear type but should, in uncomplicated cases, reach its maximum during the first week of illness. Even in anginose cases 50,000 would be a very high figure for the white cells. In this case, well in the second week, this number was greatly exceeded, and this excess is evidently connected with the purpuric state. Dr. Joseph Bamforth, of St. Thomas's Hospital, allows us to state that he has a paper in course of publication on the purpura produced by arsenobenzol poisoning, in which he adduces evidence that marked leucopenia and polymorphonuclear deficiency in this type of purpura are of fatal prognostic import, whereas leucocytosis and polymorphonuclear excess point to recovery.

The basis of purpura fulminans is held to be a capillary toxicosis combined with platelet deficiency, the latter being due to a myelotoxicosis. This combination is the underlying condition in purpura variolosa (hæmorrhagic small-pox), where in addition a marked leucopenia is also in evidence.

It is possible that some distinction should be drawn between cases of scarlet fever in which hæmorrhages accompany and transform the scarlatinal eruption and these, like the one now described, in which purpura develops some 14 to 16 days after the commencement of the disease. At this stage two factors are supposed to interact. The capillaries of the skin, and probably also of the kidney and mucous membranes, have made but little recovery from the damage they have received from the infection, but the decisive factor is held to be the onset of an anaphylactic phase.

E. Frank argues for an accompanying platelet deficiency in these cases, but admits that positive evidence is lacking. This evidence our case seems to supply. The distinction usually drawn between purpura limited to cutaneous structures and purpura involving mucous membranes alone or in addition to the skin, may not after all be a fundamental one, since transitional cases are recorded.

ESTIMATION OF UREA IN URINE.

By Duncan Leys, M.B. Oxf., M.R.C.P. Lond.,

ASSISTANT TO THE MEDICAL UNIT, WELSH NATIONAL SCHOOL OF MEDICINE, CARDIFF.

The commonly used methods of estimating urea in urine are the hypobromite and the urease. The first, which is simple and rapid, has been discarded for scientific work on the grounds of inaccuracy since, while it gives quantitative results with pure solutions of urea, other nitrogenous bodies in the urine contribute to the nitrogen evolved. The continued use of the hypobromite method in clinical work for the application of the MacLean-de Wesselow urea-concentration test makes this a matter of some importance. The fact that the usual calculation is based on an erroneous chemical equation which assumes that all the urea nitrogen is converted to gaseous nitrogen is of little importance: the deficiency due to cyanate formation, &c., is very small—e.g., an estimate calculated as 2·9 per cent. urea should be 3·0 per cent. if all the urea nitrogen were measured. Ammonia is the only important source of non-urea nitrogen: it has two origins (*a*) bacterial decomposition of urea, and (*b*) ammonium salts of mineral and organic acids. The total nitrogen evolved by the hypobromite is unaffected by factor (*a*) except in so far as some of the ammonia may evaporate and decrease the total estimate, giving a worse picture of kidney function than the true one. Factor (*b*) is chiefly of importance when excess of ammonia is excreted in combination with organic acids in the "acidosis" of diabetes, since the normal excretion of 0·5 to 1·0 g. per day (about 0·075 per cent.) may then rise to 4 or 5 g. (0·5 per cent.). When this is associated with poor renal function, the error may amount to almost 100 per cent. As illustration, the following figures were obtained by increasing the ammonia content of a urine by added ammonium chloride.

Original estimation by urease method 0·85 per cent. urea (ammonia 0·01 per cent.).

	Nitrogen evolved.	Equivalent as urea per cent.
Original estimation by hypobromite	12·5 c.cm.	0·83
Added salt equivalent to 0·3 per cent. ammonia	17·5 ,, ...	1·16
Added salt equivalent to 0·6 per cent. ammonia	21·4 ,, ...	1·43

The error, if remembered, can be allowed for except in the rare conjunction of acidosis and bacilluria. The simplest procedure is to estimate the ammonia and amino-acids by the formol method, if there is suspicion of acidosis—in practice, if there is a positive nitroprusside test—whenever an estimate of urea excretion is needed. The estimate takes a few minutes only. The ammonia nitrogen is quantitatively released by the hypobromite.[1] 1·0 g. ammonia gives 14/17 g. nitrogen, or 11·2/17 litres nitrogen, or 658 c.cm. If 4 c.cm. urine are used for the urea estimation, 2·6 c.cm. nitrogen should be subtracted from the result for every 0·1 per cent. ammonia present. For example, a diabetic urine (sugar 4·5 per cent., positive nitroprusside reaction) gave:—

Urea by hypobromite method: nitrogen evolved 30 c.cm.; apparent urea 2·0 per cent.
Ammonia by formalin method 0·32 per cent. (By aeration 0·33 per cent.)
Subtract 3·2 × 2·6 c.cm. nitrogen for ammonia, or 8·3 c.cm.
True urea figure 21·7 c.cm. nitrogen, or 1·44 per cent. urea.

In this case an apparently normal urea figure is shown to be definitely low.

SUMMARY.

It is impossible to estimate urea excretion by the hypobromite method when there is a combination of bacilluria and "acidosis." Bacilluria alone does not appreciably affect the result. Excess ammonia in the urine in "acidosis" should be allowed for by estimating by the formalin method, and subtracting 2·6 c.cm. nitrogen for every 0·1 per cent. ammonia found, whenever urea excretion is estimated in patients whose urine gives a positive nitroprusside reaction.

[1] The error is, for practical purposes, negligible—e.g., 4 c.cm. of a solution of ammonium chloride representing 0·3 per cent. ammonia gave 8·0 c.cm. nitrogen, when 8·3 are demanded by the calculation.

Leicester Royal Infirmary.—Last year this hospital treated 8406 in-patients, an increase of 1000; in 1900 the number was 2799. The average cost of each in-patient was £10. Out-patient and accident cases numbered 33,738. The expenditure of £97,322 left a deficit of £10,558.

MEDICAL SOCIETIES

MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on Jan. 26th, Dr. R. A. YOUNG presided, and a discussion on the

Medical and Surgical Uses of Diathermy

was opened by Dr. E. P. CUMBERBATCH whose remarks are given in full in the front part of this issue.

Mr. W. SAMPSON HANDLEY said that surgeons in this country owed a debt of gratitude to Dr. Cumberbatch for his persistent advocacy of a method which had proved so useful, especially in cancer surgery. Diathermy sterilised the tissues from bacteria to a considerable depth, and this was of importance in operations on cancer of the cervix and rectum where secondary infection around the growth prejudiced the ultimate results. Over large fields of surgery the diathermy needle was, in his experience, superior to the knife, and he believed that in a few years a large proportion of surgical operations would be done by diathermy. He had used both the cutting current and the needle alone; those who had not previously seen the method would be astonished at the way in which the tissues faded away before the approach of the needle without pressure from the hand of the operator.

It was, he said, about ten years ago that he began to use diathermy in surgery, at first for inoperable cases of breast cancer with an ulcerated and septic surface; he had employed the needle with the view of clearing up an unpleasant mess, and had been surprised at the way in which wounds healed, whose edges could not be brought together. In a few days the raw area was red with healthy-looking granulations; healing was rapid and painless. Thus he came to use the method for ordinary operable cases of breast cancer, handling the needle just as he had handled the knife, but not in the axilla for fear of puncturing large vessels. Since 1927 he had been using diathermy practically exclusively for operating on breast cancer. Provided the machine was efficient—a very important consideration—primary union was obtained, and the wound could be sutured as completely as after a cutting operation. The method was slightly quicker than the knife. The surface left should be uncharred, and for this reason it was best to cut the skin with the ordinary knife. The diathermy knife killed all the carcinoma cells lying in the plane traversed by the needle, and in that way the risk of implanting cancer cells in fresh areas was obviated.

An important gain in breast surgery was in preventing chill. In removing a breast by the knife one difficulty was to keep the flaps warm, constant relays of hot swabs being necessary to prevent the chilling which would lead to ulceration and perhaps sloughing. With diathermy the heat sufficed to eliminate any such anxiety. Bleeding, too, was much lessened, and fewer vessels had to be tied. It was, however, better to tie a vessel than to apply a terminal persistently to the bleeding point; if applied to vessels near the pleura, pleurisy might result. Following the diathermy method there was a remarkable absence of shock, an observation which he commended to the attention of the physiologist. He was convinced that the stimulus of dividing a nerve was less after diathermy than after the knife; this might account for the comparative freedom from shock.

Surgical diathermy had certain drawbacks of its own. Ether could not be used with the method, though that was immaterial, as other anæsthetics were available. At the end of seven days the skin edges might become red, as if they were passing through a phase of lowered resistance to the patient's own staphylococci. This could be counteracted by spraying daily with antistaphylococcus virus. The most serious danger was of over-heating a long thin flap which had been raised up by the needle, as this might thrombose the nourishing vessels; care must be exercised in the strength of current used. During the past three years he had been endeavouring to extend the scope of diathermy to operations within the abdomen. For gastrectomy it possessed many technical advantages; shock was to a large extent eliminated, and there was an absence of the usual rapid pulse and collapse. He used diathermy for dividing the stomach, duodenum, and omentum, after applying clamps in the usual way. He showed a stomach removed in this way five days previously, free of any charring at the edges; the chart indicated a return to the pre-operation pulse-rate within five days. No transfusion was necessary; the patient just had free supplies of saline. The diathermy needle must not, he said, be allowed to touch the bowel, as perforation would then ensue, either immediately or in a few days. He used a strand cut from the omentum to strengthen the line of suture in the stomach.

DISCUSSION.

Dr. F. D. HOWITT said there were three main fields for diathermy. The first was the surgical, in which the current was concentrated at the active electrode in order to produce destruction at that point. Secondly, medical diathermy, used when the production of heat was required internally, the electrodes being placed accordingly. Thirdly, its employment when sufficient heat was required to be generated to sterilise tissues in cases of bacterial invasion, without causing destruction of the tissues themselves. It had long been a matter of debate as to whether diathermy had any effect other than that of producing heat. Dr. Cumberbatch and others considered that the raising of temperature was the only effect, while such authorities as Nagelschmidt believed there was in addition a definite electrical effect. The speaker had tried to settle the point by putting bacteria in capsules and applying the diathermy current, when it was found that the bacteria died at the same temperature as they did in an incubator. He had been pleased with the results of diathermy in cervical erosion and surgical sepsis. It was valuable for anal fistula and spasm, also for the inflammation which sometimes ensued after removal of hæmorrhoids. Anal spasm caused anæmia of the tissues, and this prevented the mucous membrane from healing. After a special electrode had been kept in the anus a few minutes the anus relaxed, and progressively larger electrodes could be inserted. Fissure of the anus could also be treated in the same way. Another condition amenable to diathermy was cyclitis. Ophthalmologists told him that the main indication in this condition was the application of heat. When heat was applied by the ordinary means of conduction and radiation to a vascular organ like the eye it was quickly carried away by the superficial circulation. The eye was of an awkward shape for the placing of a pad, but by using an electrode with a metal base, shaped like an ordinary eye-cup and filled with normal saline, diathermy could be applied

so that the concentrated heat reached the interior of the orbit. Mr. O. G. Morgan had treated thus at Guy's Hospital 14 cases of cyclitis, three of which were acute, and some of them followed cataract extraction; nearly all did well in spite of age. The treatment resulted in a diminution of ciliary congestion and of pain in and around the eye, and in disappearance of keratitis punctata. Usually 10 to 12 sittings were necessary.

Mr. C. HAMBLEN THOMAS spoke of the application of diathermy to ear diseases; in older conditions the relief was only temporary, as judged by the hearing. For tonsils he thought it would be difficult to sterilise a deep-seated infection at the base near the capsule. When removed a tonsil was often found to have a small abscess at its base.

Mr. W. IBBOTSON spoke of a case in which he removed, by diathermy, a carcinoma of the pharynx; the rapid healing afterwards surprised him.

Mr. MORTIMER WOOLF said that for two years he had used diathermy in all operations for carcinoma of the breast; shock was less, operation was quicker; it was miraculous how the tissues disappeared on the approach of the needle. Recently he had been dividing the skin with a very fine diathermy needle, using a rather stronger current. If done at the right speed it was easy to obviate charring on the one hand, or scratching on the other. He now used the knife only in the region of the axillary vein, for fear of producing a clot which might extend into the main vein.

Mr. PHILIP TURNER referred to two cases which he had treated by diathermy 17 and 18 years previously and were now well and showing no signs of disease. One was that of a woman who had malignant ulceration of the lip and nose, whom he showed to the

Clinical Section of the Royal Society of Medicine at the time. The other was a patient with advanced tuberculous glands and broken-down sinuses, the condition persisting year after year, and there were several calcareous masses in the neck. These end-results were interesting in the light of the much greater use of diathermy at the present day for various conditions.

REPLY.

Dr. CUMBERBATCH, after saying he thought Mr. Handley must have been the first in this country to use the cutting current in abdominal surgery, raised the question of nomenclature. The term "diathermy knife" had been used, but it was, he thought, confusing because one could use a scalpel as an active electrode, first coagulating the tissue around it, and then cutting through it; that was the diathermy knife, but the reference was to a needle and the cutting current. The term "cutting current" was suitably applied to the current itself. For the electrode which divides the tissue the term "acusector" had been suggested by Howard Kelly, while Wyeth, the protagonist of cutting current surgery in the United States, preferred the term "endothermy knife." A special machine had been constructed in America under the direction of Harvey Cushing and Bovie for producing various kinds of cutting current. Whereas the same current would cut all kinds of tissue, such as skin, fat, muscle, &c., it must be modified for each tissue if healing by primary union was to occur. The English machines did not, he thought, give precisely the same kind of current as the American; they gave a current which could coagulate en masse as well as cut. It was uncertain whether a coagulating current was equally suitable for cutting. The current from a machine in Howard Kelly's clinic, which he had tried, cut beautifully but did not coagulate; for the latter purpose the current from an adjoining part of the machine was used. Dr. Howitt had spoken of the method of action of oscillatory currents. For himself, he felt sure that it was the heat that was responsible for the therapeutic effects, though possibly the currents might have in addition some other action on chemical processes. Prof. d'Arsonval had found that the application of high-frequency currents to diphtheritic toxin caused a reduction of the toxicity, even when precautions were taken to prevent rise of temperature. In reference to Mr. Thomas's remarks on the application of diathermy in otology, he had so treated a few cases of catarrhal deafness but without striking results. The action of the current in diseases of the eye and ear was simply to raise the temperature of the interior; where there was inflammation the effect of the heat was to aid the resolution of the inflammation. Another effect was to increase the blood-supply. Vaso-dilatation had been talked of, but it was, he thought, more correct to attribute the increased blood-supply to acceleration of the circulation. At a temperature even as high as 114° F. there was surprisingly little erythema, but diathermy increased the rate of flow of the blood, perhaps by diminishing its viscosity.

As to the use of diathermy in the throat it had been claimed possible to destroy the entire tonsil at one sitting; on the other hand, Dr. Dan McKenzie recommended piecemeal destruction, the operation being repeated at intervals of a week or more until no lymphoid tissue remained. In the pharynx massive malignant growths could be coagulated by diathermy, leaving the patients in so little discomfort that they would be able on the next day to sit up in bed or even walk about. Mr. Woolf had spoken of the Anderson method of stopping the hæmorrhage from the larger vessels which took place when they were cut. Their divided ends were picked up with forceps and the current directed along the metal; it heated the ends of the vessels until they coagulated. The sealed ends, coagulated in this way, remained in the wound which healed by first intention. But were these vessels permanently sealed? Mr. Dunhill had told him of a case in which hæmorrhage had occurred from one of these supposedly sealed vessels. The long duration of freedom from return in Mr. Turner's cases constituted, he thought, a record. A case of ulcer of the lip, clinically malignant, treated by diathermy was free from recurrence, he said, five years afterwards; but he had no microscopic evidence as to its true nature.

REVIEWS AND NOTICES OF BOOKS

Blood: A Study in General Physiology.

By L. J. HENDERSON. London: Humphrey Milford, Oxford University Press. 1930. Pp. 390. With 229 figures. 23s.

ONE of the most important problems in physiology is the mechanism by which oxygen is brought to the tissues, and carbon dioxide carried away, without unnecessary disturbance of the internal environment of the body. The conditions governing the combination of oxygen with hæmoglobin, and the influence of carbon dioxide and electrolytes on the hæmoglobin-oxyhæmoglobin equilibria have long been studied, and in recent years our knowledge has been extended and clarified largely by the work of Barcroft and the Cambridge School. The method whereby the acid-base balance of the body fluids is maintained has also engaged the attention of workers all over the world, but it is only within comparatively recent times that the work of Van Slyke, and of Henderson, and their collaborators has led to the consideration of the inter-relationship of changes involving the numerous electrolytes of the blood. The importance of such mechanism as the "chloride shift" in the buffering action of the blood—as opposed to that of plasma—has thus been made clear. A useful introduction to the subject was afforded by the lectures delivered in London in 1925 by Prof. Henderson, and subsequently published by the University of London Press. In this work Prof. Henderson treats in much greater detail the physico-chemical equilibria affecting the distribution of various electrolytes between cells and plasma of arterial and venous blood. He also describes clearly the mechanisms which are adopted by the body at work and in disease, in the attempt to keep constant the internal environment, and particularly the hydrogen-ion concentration. Workers in general physiology who appreciated the lectures will welcome a book which gives much more fully the results of investigations into the acid-base balance of the blood, not only in health but also in disease.

Cold in Relation to Skin Diseases.

By H. HAXTHAUSEN, M.D., Physician to the Finsen Light Institute, Copenhagen. London: William Heinemann, Ltd. 1930. Pp. 163. 16s.

THE mode of action of a universal stimulus such as cold on the normal functions of the skin presents important problems both to the physiologist and the dermatologist, and when that factor is studied in its relation to cutaneous disease, we are provided with a new angle of vision. Dr. Haxthausen argues that the stimulus of cold, owing to the modern vagaries of feminine fashions, is a factor of increasing importance in dermatology and justifies a collective survey of the subject. The first 50 pages of the book are concerned with the normal responses of the cutaneous vessels to temperatures varying between 20° C. and 0–6° C. (e.g., solid CO_2 treatment), and include a summary of the classical physiological experiments of Krogh, Ebbecke, and Sir T. Lewis on the normal reactions of the cutaneous circulation. Frostbite and trench foot are next considered, and then follows a detailed essay on the pathology of chilblains and that relatively modern and by no means rare condition termed erythrocyanosis crurum puellaris. These, together with acrocyanosis, erythema pernio papulosum, and senile chilblains, are all grouped under the collective title, Perniones. A large section is devoted to their treatment, and we are then led to a consideration of the influence of perniosis in the development and distribution of tuberculosis cutis—e.g., Bazin's disease, and lupus vulgaris, eczema, rosacea, psoriasis and lupus erythematosus, and the trichophytides.

A more scholarly and lucid exposition could hardly have been devised, and we are indebted for an excellent English translation, which cannot fall far short of the original, to Dr. W. Jenkins Oliver, late dermatologist of the Prince of Wales's Hospital, Tottenham. The general arrangement and the many typical illustrations of actual cases are of a high standard.

Handbuch der Kindertuberkulose.

Vol. I. By Prof. Dr. ST. ENGEL and Prof. Dr. CL. PIRQUET. Leipzig: Georg Thieme. 1930. Pp. 886. M.125.

THIS text-book shows keen industry and covers a lot of ground. A preliminary section deals with the different strains of tubercle bacillus, and a final section with chronic pulmonary disease of a non-specific indeterminate nature; between these two extremes is a vast territory which can be briefly indicated.

The volume is divided into four main parts: (*a*) general pathology and pathological anatomy; (*b*) clinical; (*c*) tuberculosis of the different organs; and (*d*) paratuberculosis, including the differential diagnosis of the more important diseases which are regarded as not specifically tuberculosis. The editors are to be congratulated on a choice of their many collaborators from various countries. Prof. Lydia Rabinowitsch-Kempner and Dr. A. Stanley Griffith write on bacteriology, Prof. Anton Ghon, Dr. Herbert Kudlich and others on the primary complex and all those cognate matters which we have come to associate with this condition. Prof. Bruno Lange deals with infection, and brings up to date his well-known contributions to the study of droplet and dust infection. Dr. Wilhelm Weinberg deals with epidemiological work on tuberculosis and the family, and collects a quantity of statistical material on a subject which is rather scattered in the literature. The long section of pathological anatomy is in the hands of Prof. Hermann Beitzke and Dr. W. Pagel, while under the section of general pathology are brought together subjects which have not always been well correlated in the past. These include immunology (Prof. Julius Bauer), reinfection (Dr. Franz Redeker), and clinical stages of tuberculosis (Dr. Franz Hamburger). Prof. Stefan Engel and Dr. Selma Segall have written a section on various questions relating to the age and onset of tuberculosis in childhood, including morbidity and mortality statistics and tuberculin tests.

In the clinical part of the book nearly 100 pages are devoted to the primary complex in its various aspects, apart from much material on the subject in other parts of the book, contributed by Dr. Herbert Koch, Dr. Berthold Epstein, Prof. Engel, and Dr. Richard Priesel. Another large section also deals with the portals of entry from various points of view. The usual continental method of studying tuberculosis in three stages, primary, secondary, and tertiary, is adopted. Under the term secondary stage is included bacillæmia, secondary tuberculosis of the lung, perifocal inflammation, and tuberculous

meningitis and miliary tuberculosis. In the third stage is included late pulmonary tuberculosis with its various complications as seen in older children. This stage is described by Dr. Otto Wiese at considerable length and forms one of the most interesting portions of the book. The section on tuberculosis of the different organs includes accounts of tuberculosis of the skin (Dr. Carl Leiner and Dr. Felix Basch), of the pleura and peritoneum (Prof. E. Mayerhofer), of the genito-urinary tract (Dr. Richard Wagner), of the eye (Prof. Josef Igersheimer), and of the ear (Dr. Rudolf Leidler). Bone and joint tuberculosis together with lymph gland tuberculosis is also included in this section, and has been ably condensed into some 50 to 60 pages by Dr. Priesel. In the final section on paratuberculosis Dr. Arvid Wallgren discusses erythema nodosum, phlyctenular conjunctivitis, acute serous pleurisy, and tuberculous rheumatism; Dr. Ernst Moro and Dr. Walter Keller deal with scrofulosis, Dr. Wagner with various types of lymphadenoma, and Dr. Hans Vogt with chronic non-specific lung disease.

We believe that English readers will be particularly glad to have available the large mass of material to be found in the book on the primary complex and its implications in childhood tuberculosis.

The work is plentifully illustrated, and each section has a bibliography. There is no subject index; presumably this is intended to go into a subsequent volume. Every student of pædiatrics would be glad to possess this authoritative book of reference.

Ethnos or the Problem of Race.

By Sir ARTHUR KEITH. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1931. Pp. 92. 2*s*. 6*d*.

IN this recent addition to the To-day and To-morrow Series, Sir Arthur Keith makes the departure, for an anthropologist, of writing politically. He has done this deliberately, finding it impossible to write about human races without touching on matters which concern statesmen just as much as anthropologists, and hoping to induce politically minded people to study racial problems from the anthropological aspect. He makes out a good case indeed for the serious consideration of these problems by statesmen; already they are obtruded upon the attention of The League of Nations, which might be considered, at any rate in design, as an international committee of statesmen. A large portion of the book is taken up with the close consideration of the views of Huxley on the classification of races, when Sir Arthur says that, while from long experience he has learned the danger of disagreeing with any of Huxley's verdicts, he finds an evolutionary conception to be more elastic than Huxley's methods of classification.

The primary purpose of the book is to give a new interpretation of national unrest, and the plight of the nations to-day would suggest that any logical explanation of what lies below the political troubles would be welcomed in most or all the States of Europe. Sir Arthur's message is that unrest, as seen in these States, forms a modified reassertion of man's inherited instincts, and he makes out a good case for the individual racial instinct as a factor in the world's progress. The outcome of complete deracialisation of the world, if such a thing be possible, he would regard as a form of retrogression; but the manifestation of national independence must be controlled, and for this task statesmen will be fitted by mastering the evolutionary significance of races.

Infant Nutrition.

By WILLIAMS MCKIM MARRIOTT, B.S., M.D., Professor of Pediatrics, Washington University. London: Henry Kimpton. 1930. Pp. 375. 25*s*.

A WORK from so authoritative a source as Prof. Marriott will not fail to command attention, and his book will be recognised as an important contribution to medical literature. It is not only a manual on feeding, but represents an extremely successful correlation of the theoretical and practical aspects of infant nutrition in health and disease. Throughout the book the reader will find emphasised two aspects of teaching which are characteristic. The first may be expressed in the author's own words: "the giving of food of too low a caloric value to meet the infant's needs is by all odds the chief cause of failure in infant feeding." The second relates to the importance attached to parenteral infections as factors in nutritional disturbances of infancy. The first chapters of the book are devoted to physiology, and the metabolism of fats, carbohydrates, and proteins are discussed in turn. The chapter on artificial feeding of normal infants has the great advantage that the rationale and technique of a number of different methods are described in detail, while the methods recommended are comparatively simple. The use of acid milks receives special attention. The latter part of the work contains admirable accounts of the various nutritional disorders, their treatment being presented in sufficient detail to guide the practitioner. The section on marasmus is particularly clear, and is rendered still more so by the feeding charts which accompany it. The final chapter on acidosis and alkalosis discusses fully the biochemical processes which underlie these disturbances.

The book should have a wide range of utility; it may be recommended equally to the specialist and the practitioner as one of the most lucid and complete presentations of the subject at present available.

Epidemiological Essays.

By F. G. CROOKSHANK, M.D., F.R.C.P. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 136. 7*s*. 6*d*.

IT is pleasant to see these valuable essays (previously published in THE LANCET and other medical journals) conveniently collected in book form. They form delightful post-prandial reading. The collection ranges from concrete suggestions on the advisability of more active treatment of encephalitis lethargica and lobar pneumonia to considerations which might be regarded as a contribution towards modern astrology. The keynote to the frame of mind in which the author has conceived the essays of more strictly epidemiological import is to be found in the quotation from Hippocrates, "Airs, Waters, and Places": "If it shall be thought that all these things belong rather to meteorology, it will be admitted, on second thoughts, that the study of the heavenly bodies contributes, not a little, but a very great deal indeed, to Medicine. Thus, with the seasons, men's diseases, like their digestive organs, suffer a change."

Although no ready and convincing explanation can always be found for the benefits derived from spa treatment, the conception of its possibilities has surely undergone a change in recent years. Dr. Crookshank's essays have undoubtedly contributed to this change, which is reflected in the increased respect shown by physicians towards the claims of British and foreign health resorts.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 7, 1931.

THE SMALL-POX HOSPITAL.

THE mild type of small-pox which has lately been prevalent here and in Western Europe has raised some questions as to the time-honoured procedure for the control of epidemics of this disease. The recognised measures consist broadly of complete isolation of cases, prompt and thorough pursuit of contacts, their immediate vaccination and sometimes their partial segregation, very thorough disinfection of infected premises or things, destruction even of fomites, and general vaccination of the invaded community. When the present wave of prevalence commenced some nine years ago these measures were vigorously applied, but it would probably be correct to say that few medical officers of health who have had experience of the current type of small-pox are now greatly concerned when it is notified to them, and that the preventive activities they initiate hardly exceed those which apply to the common run of communicable diseases. The reason is obvious. Classical small-pox is a disease with a mortality varying from 20 to 40 per cent. or more in the unvaccinated and causing serious disability and disfigurement in many of the survivors. The prevalent type is practically non-fatal and has few grave consequences. There is much to be said for distinguishing it by name, and in his appendix [1] to the Rolleston Committee's recent report Dr. JORGE has familiarised all of us with the term variola minor, replacing the term alastrim which has failed to become current in this country. It is very important that this distinction in character should be recognised, for there is a danger that a generation accustomed to the mild type may grow up with the impression that measures applicable to it will be effective in the control of classical small-pox. Apart from its virulence the infectivity of the latter is high, extremely persistent, and possibly of long range. Those characteristics have been exemplified little more than a year ago by the virulent strain introduced from India on the s.s. *Tuscania*. Experience of variola minor on the other hand indicates that its transmission is not characterised by any of these features.

In considering therefore the need for separate small-pox hospitals such variations of type must be kept in mind. There is probably little risk of transferring the infection of variola minor from one ward to another in an isolation hospital if the staff are protected by vaccination and exercise the same precautions as they do for other communicable disease. Even if so-called crossing of wards were to occur, it would not be a matter of much consequence. But the case is different with variola major. Provided of course that our population were uniformly protected by sufficiently recent vaccination, there should be no difficulty in treating virulent small-pox in a fever hospital, or indeed in the septic wards of a general hospital. But we have to face the fact that far more than half the population of this country is susceptible and that the prospect of any change for the better is exceedingly remote. If then there is any justification for the belief that the difficulty of controlling variola major is not only a result of partially immune and therefore missed cases carrying the infection, but also of the tendency of the infective agent to survive outside the human body and to resist any but the most thorough processes of disinfection, it would seem to be a matter of practical necessity to retain special institutions for the reception of cases of this virulent disease.

It is wasteful however to multiply such hospitals and to leave them standing empty for long periods of years. In some areas a compromise has been made by using them for mild forms of tuberculosis which can be rapidly evacuated without danger in any emergency. This is not entirely satisfactory, as the hospitals have rarely been constructed on lines quite suitable for tuberculosis and moreover it is impossible to ensure that all the cases will be fit for sudden transference at any time. It may be suggested that a solution of the problems with which county councils are faced under Section 63 of the Local Government Act, 1929, may be found along the lines of abolishing many of the small and often derelict small-pox hospitals, and concentrating on a few larger institutions designed in such a way as to be suitable for use in non-epidemic times for some other disease or diseases. In order to avoid the turmoil of evacuation for the admission of sporadic cases of small-pox, and in any case to allow their transference to be done at reasonable leisure in a grave emergency, comparatively small isolated blocks, capable of independent administration, might be attached to one or more fever hospitals in each area, and these would also serve for the isolation of cases of variola minor. It is essential at least that the whole question should receive careful consideration. The recent widespread diffusion of variola minor, a disease apparently of comparatively low infectivity, is a warning that the population in its present partially vaccinated condition might be devastated by virulent small-pox if it once gained a footing. It seems to us that it would be unsafe to discard entirely the separate small-pox hospital.

[1] See THE LANCET, Jan. 24th, p. 210.

RICKETS AND ADENOIDS.

EARLY in 1927 the Board of Education's Committee on Adenoids and Enlarged Tonsils decided to institute an investigation to test the conclusions of Dr. J. W. MCINTOSH and Dr. G. C. M'GONIGLE, medical officer of health for Stockton-on-Tees, who had demonstrated a close association between slight bony abnormalities, enlarged tonsils, and mouth-breathing. For this purpose 1638 unselected

5-year-old children have been examined by three independent observers and a full report has been published.[1] The schools in which the examination was carried out varied considerably in their social status, and the bony signs sought seemed to have a definite association with poverty and defective housing. Parietal and frontal bossing, knock-knee, bow-legs, and deformity of the chest wall, five of the signs selected, have been definitely standardised while the other four—enlarged radial epiphysis, spinal curvature, bowing of tibia, and beading of ribs—leave more to the individual judgment of the examiner. All three observers, however, found that knock-knee was the commonest abnormality, followed by parietal bossing, frontal bossing, and abnormalities of the chest wall. The nasopharynx was only "normal" in 17·4 per cent. of children who had not already been operated on. Some degree of adenoids was found in 54·9 per cent. and of tonsillar enlargement alone in another 14·2 per cent. The condition of the nasopharynx bore no relation to the social status of the school; in fact the proportion of children free from adenoids was highest in the poorest groups of schools. Of the 1293 children examined only 4·7 per cent. were free from caries, while another 11·7 per cent. had a slight degree of caries only. Severe caries was more prevalent in the poorer schools.

The conclusions of the investigators were that adenoids were as common among children free from rickets as among those showing some bony signs, but that adenoids of a severe degree occurred more frequently among children with two, three, or more signs of rickets than among those showing one sign or no sign. It is, of course, admitted in the report that the signs selected are not necessarily certain signs of rickets. The figures also suggest some connexion between widespread caries and adenoids. The dental condition was best in the group of 148 children whose adenoids had been removed, but this may point rather to a higher standard of parental responsibility than to any association between adenoids and dental disease. There was a similar association between dental defects and septic tonsils; there may be a common cause or the tonsil infection may be secondary to that of the teeth. There seems to be a definite association between defects of the temporary dentition and rickets.

If the signs accepted by these investigators are in fact signs of deficiency of vitamin D, then their results show that slight enlargement of the adenoid tissue may occur as commonly among children showing no signs of that deficiency as among those in whom it is marked, but that extensive enlargement is more frequent in children who have signs of rickets, caries, or dental hypoplasia. The association is not dramatic but is too consistent to be a coincidence; moreover, it was observed by three independent investigators. It is not, however, clear what the relationship really is. Social factors affect rickets and caries, but have no influence on adenoids. Vitamin D is closely associated with vitamin A, and the actual factor concerned in adenoids may be a deficiency of either or both vitamins. It has been shown that an adequate supply of vitamin A is necessary to maintain a healthy condition of the mucous membrane, and the lack of it may predispose to an overgrowth of nasopharyngeal lymphoid tissue. This view, however, seems to conflict with the fact that adenoids are as common in better-class schools as in the poorest, though rickets and dental caries are commoner in the poorer schools. The Committee conclude that a deficiency of fat-soluble vitamins, though not predominant, is one of the factors tending to produce an overgrowth of adenoid tissue, but think that there are other undiscovered factors affecting all classes alike which counterbalance or mask the influence of vitamins. What this other factor may be is a matter for speculation; some light might, perhaps, be thrown on it by a census revealing the article of diet which is most unpopular among children of all classes.

[1] Board of Education, Committee on Adenoids and Enlarged Tonsils. Second Interim Report. H.M. Stationery Office. Pp. 28. 6d.

FOG ON THE MEUSE.

THE official inquiry into the cause of the deaths which occurred, early in December last, in the Meuse valley during a thick fog is not yet complete, although an interim report issued a few days ago states that, as a result of post-mortem examination, it has been ascertained that there was an irritation of the respiratory organs similar to that produced by sulphur dioxide. Meanwhile those interested should study the account[1] of a visit paid by Prof. W. STORM VAN LEEUWEN, of Leiden, to the scene of the catastrophe, where he was provided by the Hygienic Commission with every facility for making his own survey. He writes:—

"During Dec. 1st, a Monday, there arose in the greater part of Belgium and Holland a severe fog which was especially thick in the Meuse valley. In the remarkable absence of wind this fog remained hanging in the valley until Thursday afternoon, then disappeared, to return on Friday and finally disappear on Saturday. On Tuesday and Wednesday the fog hung especially heavy in the valley south of Liége. Here the valley is shut in on both sides by hills some 50 to 60 metres in height; the fog reached not much higher than the edge of the plateau. On Monday and Tuesday nothing particular happened, but on Wednesday about midday the alarm was given and the doctors remained busy the whole of that night and the next day up till Thursday. A large number of persons complained of irritation in the nose, mouth, throat, trachea, and bronchi. The mucous membranes were red and swollen, the redness and swelling extending—as has been shown by post-mortem examination—into the larger branches of the bronchi without reaching the smaller ones. Among the patients there was violent cough irritation, the respiration-rate exceeded 40 per minute, in the severe cases urgent dyspnœa rapidly came on, with dilatation of the heart, very frequent pulse, and cyanosis; 63 patients died, all within something more than 24 hours. At noon on Thursday the fog disappeared and no new fatalities occurred, nor any new cases, while those who were still alive quickly recovered and after a few days showed scarcely any symptoms of illness.

"In the severe cases there were no symptoms of

[1] Münch. med. Woch., Jan. 9th, 1930, p. 49.

inflammation of the lung (nor were any found post-mortem), only rhonchi and sibili were to be heard in the bronchi. Injections of adrenalin brought temporary relief. Cardiac tonics were also given, but their action was difficult to assess, especially as almost all the patients were nursed at home. How many cases occurred has not yet been settled. The number must amount to several hundreds; one doctor, for instance, visited 69 patients on the Thursday. Among the serious cases, and especially among the fatal cases, were many elderly persons, asthmatics, bronchitics, and cardiac cases, but it has been established with certainty that also young persons who before had shown no sort of illness became severely ill, while many otherwise normal persons who did not become ill experienced unpleasant symptoms of irritation in the neck and throat. No specific taste or smell was remarked, partly due no doubt to the fact that the subjects were already blunted to the smell of this neighbourhood. As I passed through the neighbourhood later I could quite clearly detect the taste, for instance, of sulphur dioxide.

"It is important—as I ascertained with certainty on questioning doctors in the neighbourhood—that persons became ill and died who had not left the house or even left their bed, and it was made clear to me by the doctors that the fog (as for instance occurs with London fog) had certainly not penetrated into the houses. This means that in the higher temperature of the dwelling the fog droplets became vapourised, which often does not happen in London owing to an oily layer surrounding the droplets.[2] Further, it is worthy of mention that although the fog hung in the whole Meuse valley and far beyond its limits, cases of illness occurred only in a region 25 km. long by 1 to 2 km. broad south of Liége. The town of Liége itself remained free. Huy had only a few patients and no fatal cases, while Engis, 20 km. south of Liége, had relatively the most cases and fatalities."

At the close of this admirable summary Prof. VAN LEEUWEN adds his own explanation of the catastrophe. He mentions only to discard such rumours as shortage of oxygen, presence of war gases, fall from the sky of Sahara sand. The theory that fog in itself was responsible seems, he says, little likely to one who dwells on the Dutch coast, where for days on end a cold thick fog may hang without causing sickness. Liége itself lay in thick fog and was unscathed. The clue to the catastrophe must be found in the fact that the region is so strewn with zinc, superphosphate, and other works that under normal circumstances the air contains sulphur dioxide and hydrofluoric acid, if not other irritating substances. Owing to the acidity of the soil the neighbourhood has been spoiled for agriculture and grazing; breeders have obtained damages from the manufacturers on this account. Electric light bulbs, it seems, lose their transparency in one part of the valley quicker than elsewhere, and the inhabitants are aware of irritating substances in the air, especially in the neighbourhood of Engis. From these data he concludes that poisonous substances are present even in normal times in appreciable quantity in the air of the neighbourhood. Now from Dec. 1st to 3rd the air in the valley was too cold to rise, while horizontal ventilation was excluded by the stillness. Hence a concentration of the effluent factory gases must (he underlines "must") have taken place, and finally the threshold of human tolerance was reached on Dec. 3rd. Whether certain factories discharged on this day a special quantum he regards as no longer to be settled, but everything points to the fact that in the whole neighbourhood the air contained too large a quantity of harmful products, especially in the village of Engis, where big factories were at work. Search is now being made for the guilty effluents. That a repetition of the occurrence is possible is shown by the fact that something similar took place in 1911, although on a smaller scale.

Prof. STORM VAN LEEUWEN concludes with the remark that the occurrence has a general importance for medical climatology, because it has shown that in a body of cold stagnating air the concentration of harmful products may reach the limit of tolerance; and this holds true, not only for poisons from chimneys, but also from other sources, the ground for example. In the Meuse valley Nature in a colossal experiment has furnished proof of this possibility. We should be unwise to forget that a similar inversion of the temperature gradient is present over our own fogs, acting as a lid which may hold down fumes discharged below it, whether from domestic chimneys or from power stations.

[2] As to London fogs penetrating the houses we now know that this is due to the presence of great numbers of solid soot particles which remain after the water has evaporated.—ED. L.

HOSPITALS, DRUGS, AND PANEL PATIENTS.

THE Eccles and Patricroft Hospital recently made application to the Lancashire Insurance Committee to be put on the National Health Insurance panel as an institution to supply members of the staff who are insured persons with drugs, medicines, and appliances, for which payment would be made out of the insurance funds. The proposal has been turned down by the county insurance committee, but it is understood that the Patricroft Hospital authorities intend to appeal against the decision. The desire of the hospital authorities to supply medicines to the insured members of the staff is not in itself a matter of very considerable importance, but there is a question of principle involved, and it does not require much imagination to foresee the time when, by a simple extension of the principle, hospitals would be converted into dispensaries for insured persons receiving treatment in the wards or as out-patients. It is just as well in the circumstances that the county committee has refused to take a step in a somewhat dangerous direction. Pharmaceutical chemists to-day encounter a good deal of competition from a variety of quarters, and it is said to be very difficult for a large proportion of them to make a fair living solely out of the professional side of their business; hence it has become necessary for them to act as vendors of articles, many of which have but the remotest relationship to the dispensing of medicine and the sale of drugs. We do not think for a moment that hospital authorities as a whole would wish to encroach upon the chemists' ground.

DONATIONS AND BEQUESTS.—Under the will of the late Mr. Isidore Aron, of City-road, London, subject to life annuities, the Jewish Home for the Dying, Nightingale-lane, will receive nearly £700, and the Metropolitan Hospital, Kingsland-road, and the Jewish Hospital, Stepney, £1000 each. Smaller sums are bequeathed to the London Hospital, Whitechapel; the Jewish Home for Incurables, Tottenham; and the West End Hospital for Nervous Diseases.

ANNOTATIONS

HOW MUSCLES WORK.

In the Hughlings Jackson Memorial Lecture, delivered before the Section of Neurology of the Royal Society of Medicine on Jan. 28th, Sir Charles Sherrington admitted his audience to some of the mysteries of the laboratory, where our simplest actions are subjected to an analysis and experimentation that make them seem more complex than the highest flights of man's mechanical invention. The nervous system, as he said, is both a form and a series of events, and for the physiologist the best place to confront both is the Jacksonian third or lowest level, where is found the motor centre. It is now well known that every reflex stimulation fractionates its muscle; it does not reduce it to separate muscle-fibres but to a number of motor units. The soleus of the cat, for instance, contains some 230 such units, while the inner head of the gastrocnemius contains about 500. The units of the latter muscle have on an average a twitch value of eight grammes. When the fibres are put into tetanus they arrive at a fixed value, in the sense that no increase of stimulus will increase the contraction. No one nerve, however, possesses the whole of any one muscle. Faradisation of the internal saphenous, for instance, tetanises about 190 of the 300 odd units that make up the flexor of the ankle. There is evidence that, besides those units which are thrown into complete tetany by any given stimulus, there are certain other units which are affected, as it were, subliminally; as Sir Charles put it, they are tickled without being contracted. Thus investigation of any muscle unit reveals four grades: a supermaximal and a maximal, a subliminal, and an unexcited. Three years ago the work of Adrian and his colleagues and of Denny Brown filled in the gap between the maximal and the subliminal grades by demonstrating a group of fibres firing slowly at a subtetanic rate. Different rates of subtetanic grades were observed concurrently in the same muscle, and it was seen that there are in every motor neurone pool a number of motor neurones in this intermediate state of excitation, and that the firing of the motor unit does not necessarily follow closely the rate of impulse entering from the afferent nerve.

Laboratory conditions are to natural conditions, Sir Charles Sherrington said, as a musical note is to a noise, and the natural stimulation will exert a richer inequality of stimulation on the motor neurone pool. For instance, beneath the ipsilateral flexion reflex familiar to every worker there lies the ipsilateral extension reflex used for progression; the former can only be separated from the latter by avoiding stimulation of the afferent nerve altogether and going direct to the receptor organs. In real life, again, the influence of the labyrinth complicates the reflex; it may multiply it six or seven times by working on these fringe areas between the grades. If between the application of two identical stimuli the head of an animal is moved ever so slightly in such a way that the labyrinth is brought into the right position, the response may be enormously altered. Thus it transpires that the motor centre is more than a passive relay station on the path out to the muscles. It can and does grade its excitation of the individual motor unit; it is driven and fed by centripetal impulses and acts on the individual motor unit by a process of internal summation, so that it can exert a whole scale of degrees of excitation. One secret of its coördinative power is this ability, by shifting the fringes between the grades, to summate impulses. When a spinal animal is set on its feet, a reflex adaptation to its own weight will take place and the extensor reflexes will be called on to bear the burden. Their response shows a certain quantitative scale. The weakest form is simple standing, when all that the extensors have to do is to prevent the limbs from buckling under the weight of the body. They are stretched, and at once the stretch reflex is involved. This reflex, however, can by no means activate the whole of the quadriceps extensor. It is a delicate postural reflex which affects only a deep slip of the muscle—just enough to counteract the effects of gravity. From this weak type of reflex there is a whole graded series of reflexes, through walking and running to galloping and jumping. In a dog of which the spinal cord has been cut high up, it is sufficient merely to separate the pads of one foot for all four limbs to be thrown at once into the gallop position. The reflexes spread into the whole of the muscle, which has in reserve huge quantities of units three times as strong as those elicited by the postural reflex only. Sir Charles Sherrington believes that there is a great hope that before long this neuromotor mechanism may yield up the secret of its precise activity. Such a possibility calls, he said, for close liaison between clinic and laboratory; to decipher how nerve manages muscle may be to decipher how nerve manages itself, and it may well be that the nerve has in it types of excitation and depths of inhibition greater than the muscle can express—heights and depths which will lead us towards an understanding of the great mental problems of mankind.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

The annual report of this Council for 1929–30 opens with a reference to the Parliamentary history of the Mental Treatment Act, which signalises the first triumph of those who have been struggling against the spirit of apathy and resignation formerly characteristic of the public attitude to mental hygiene problems. Although this measure has now become law, the outlook for the future depends upon proper use being made of the Act, and the Council have now the twofold duty of seeing that provision for voluntary treatment—which is optional on local authorities—is actually made, and that the provision for temporary treatment—which is compulsory—is adequate. The Council look forward to the time when public opinion will be ready for a further advance: the extension of temporary treatment to any period likely to benefit the patient and its extension to early unwilling cases. The report also mentions the first International Congress on Mental Hygiene, which was held at Washington last year. The message of the Congress to this country is naturally largely the message of America, and the thing that most impressed delegates was the determination of the States to see that the moulding of their future citizen shall not suffer by the neglect of psychiatric and psychological help. America intends to attempt the solution of its psychiatric problems by child guidance, social welfare, and preventive work of all kinds.

All those who attended the last conference of the National Council in London in November, 1929, will look forward to the next conference, which is to be held from May 27th to 29th of this year. Among

the other activities of the Council have been a number of successful public lectures and drawing-room meetings. They have coöperated with the Tavistock Clinic in an attempt to raise funds for the valuable work of both. The various subcommittees have inquired into the treatment of attempted suicide, the registration of nursing homes, the prevention of delinquency, the preventable causes of nervous strain for both children and teachers in school life, social work in connexion with mental hospitals, observation wards in poor-law infirmaries, and the treatment of mental defectives. It is to be hoped that the Council will obtain the funds necessary to enable them to go on with their important work.

A NEW UROGRAPHIC MEDIUM.

WHILE intravenous or "excretion" urography is a valuable addition to the methods of genito-urinary surgery, the older technique of retrograde pyelography nevertheless retains its place. However good the shadows derived from intravenous urography may be, they lack the clearness and density of those obtained by distension of the renal pelvis. For this reason work is still being done on the best media available for outlining the pelvis after ureteral catheterisation, and Adolph A. Kutzmann reports good results with emulsified campiodol, which is a mixture of iodised rape-seed oil, acacia, and distilled water.[1] He finds that an emulsion containing 10 per cent. of iodine gives as good a shadow as that obtainable from the usual 12·5 per cent. solution of sodium iodide, but whereas sodium iodide is irritating to the tissues and often produces a severe reaction and pain, the campiodol emulsion is non-irritating.

ANTITOXIN TREATMENT OF DIPHTHERITIC PARALYSIS.

THE use of antitoxin in diphtheritic paralysis, on which we commented a few months ago,[2] is illustrated by a striking if not altogether convincing case published by Dr. J. Woroschilsky,[3] of Odessa. His patient was a girl aged 4 years, who three weeks after an attack of faucial diphtheria, treated by injection of 6000 units of antitoxin, developed paralysis not only of the palate, as manifested by a nasal voice and regurgitation of fluids through the nose, but also of the arms and legs, as well as abolition of the knee-jerks. As this condition indicated systemic impregnation with diphtheria toxin, Dr. Woroschilsky decided to continue serum treatment by daily intramuscular injections of 6000 units of antitoxin. After the third injection considerable improvement set in, so that the injections were given only every third day, and after six injections, or a total of 36,000 units, complete recovery took place. Woroschilsky claims that the case is extremely instructive from the following points of view. In the first place, he says, it shows that diphtheria antitoxin can be given even as long as three weeks after subsidence of the initial angina with a favourable effect on the characteristic complications. Secondly, the case indicates that large quantities of antitoxin in divided doses can be given to a young child without causing any symptoms of anaphylaxis. Lastly, it was remarkable that the child who had previously been the subject of the exudative diathesis as manifested by frequent attacks of bronchitis, asthma, tonsillitis, obstinate enterocolitis, and recurrent eczema and urticaria had no further symptoms of this kind and subsequently developed normally in every way. Woroschilsky suggests that, in addition to its specific action, the serum exerted a beneficial influence upon the patient by protein-therapy.

[1] Amer. Jour. Surg., 1930, x., n.s., 320.
[2] THE LANCET, 1930, ii., 1137.
[3] Therapie der Gegenwart, December, 1930.

BURNING DURING ANÆSTHESIA.

ACCIDENTAL burning of an unconscious patient has been a not very infrequent occurrence, and has led to actions at law before the one related under "Medicine and the Law" last week. There is, however, one unusual detail in the facts as they emerged at the trial, and that relates to the position of the damaging hot bottle. It was placed apparently between a draw-sheet and mackintosh on the bed, and it was placed there not by a nurse but by a maidservant. The position of the bottle was thus so inconspicuous that when two other bottles were removed at the matrons directions this one easily escaped observation. It seems plain that, supposing for the moment that the responsibliity for the safe state of the bed on the patient's return lay with the doctors, they could hardly be blamed for not having a bottle removed which had been successfully, if unintentionally, concealed from them. The doctors would surely be showing enough care if they looked in the bed, and seeing no bottle there, allowed the reposition of the patient. They should not be expected to have to feel the bed for a submerged hot bottle. The question of responsibility, moral as well as legal, admits of argument. Counsel's remarks in opening the case for the plaintiff suggest that he would regard both surgeon and anæsthetist as responsible. He is reported as saying:

> "an anæsthetist who was responsible for making a patient unconscious was under a duty to take all reasonable care to guard the patient from peril such as that encountered by the plaintiff, and to see that the unconscious patient was not put into a bed where she could receive such terrible injuries. A surgeon who performed an operation in the circumstances of the present case was bound to make sure that the patient did not come to such injury. It was not enough for the surgeon or the anæsthetist to say that they left the care of the patient to the nurse."

Yet in practice it is perfectly obvious that much care of the patient must be left to the nurse. Having chosen a competent nurse and given her directions, the doctor's responsibility is, in some circumstances, ended for the time being. If the nurse fails in properly executing her orders the responsibility cannot be shifted back to the doctor. If it could, then safety from blame for the doctor could only be secured by his doing his own nursing—an obvious absurdity. Actually most anæsthetists regard themselves as responsible while the patient is unconscious and do in fact see him/her in bed after operations. But nowadays when post-operative sleep is often a matter of hours it is obvious that the anæsthetist must be able to shift his responsibility to the nurse and to leave the patient when he has given the necessary directions. It might be maintained that the surgeon is the responsible person throughout, and the anæsthetist merely his agent. In the operating theatre, however, at the present day it is clear that the anæsthetist has a separate responsibility and the surgeon would not be blamed for an accident directly due to the anæsthetic. This responsibility of the anæsthetist it seems logical to consider is prolonged into the bedroom where the patient lies still unconscious. It appears that plaintiff's counsel realised the impossibility of holding the doctors responsible in all circumstances, for after

explaining that there was never any allegation of negligence as far as their professional skill was concerned he said :

"The allegation in the case of the doctors is a particular allegation that in particular circumstances a particular duty rested on the surgeon and the anæsthetist. Having regard to the evidence he would not be able to substantiate that allegation of negligence and he wished completely to withdraw it."

We imagine that these words would apply even if the nursing home had been selected by the surgeon and not by the patient. There was, by the way, no allegation, except in the lay press, that the doctors' fees were too high ; as a matter of fact they were moderate, for the total quoted covered the surgeon's fee for the operation as well as 445 visits.

The purely medical aspect of these burns caused during anæsthesia is interesting. The circumstances of their causation are peculiar, admitting of prolonged pressure by a heated object on tissues which are anæsthetic and immobile. The resulting lesion is generally deep and slow to heal. It is probable that during anæsthesia the skin and underlying structures are liable to damage from an amount of heat and of pressure that would be much less harmful to the conscious person, supposing that he were able to tolerate them. And the heat need not, it seems, be very great. This may be owing to the depressed circulation in the affected part as well as to deficient trophic nervous influence during anæsthesia. The readiness with which the surface of the eye is damaged in a person who is under an anæsthetic is another evidence of the extra susceptibility of patients in this state. Plainly those whose duty it is to instruct students in giving anæsthetics, and nurses in caring for patients, after them cannot dwell too emphatically on the precautions which must be taken to protect the eye during anæsthesia, and to avoid the possibility of contact between the unconscious patient and any heated object. Burns have arisen not only from hot bottles after operations but from contact with a lamp or from a heated table in the operating theatre itself.

EVIDENCE OF A VIRUS IN THE BLOOD IN PERNICIOUS ANÆMIA.

Prof. Axel Holst, whose pioneer work on beri-beri was one of the first steps towards the discovery of the part played by vitamins in certain diseases, has just published [1] an account of laborious investigations conducted over a period of many years into the ætiology of pernicious anæmia. Certain of these led him into blind alleys ; but the following observations will no doubt challenge repetition. To solutions of hæmoglobin obtained from blood clots and containing a little serum, he added 0·5 c.cm. of blood taken from patients suffering from pernicious anæmia or from some other disease. The solution was then passed through a Pasteur-Chamberland filter L 3 to get rid of any streptococci or other contaminating bacteria that might be present. From 0·5 to 1 c.cm. of the filtrate was transferred to a new solution of hæmoglobin and kept at a temperature of 37° C. After about 24 hours all the solutions became somewhat cloudy and darker in colour ; within a few days the pernicious anæmia tubes became much darker than the controls. When a few drops were transferred from these tubes to a new series of tubes containing a solution of hæmoglobin, the pernicious anæmia tubes again soon became much darker than the controls, and the same thing was observed during repetitions of this experiment in the course of several months, provided the interval between each was not too long. Prof. Holst has thus examined the blood of 23 patients suffering from pernicious anæmia, in 17 of whom the above phenomenon was observed. Among these 17 were several making a good recovery under treatment with liver. He concludes that his observations indicate the presence, in the blood of patients suffering from pernicious anæmia, of a filtrable agent capable of reproducing itself under favourable conditions. He has also demonstrated spectroscopic changes in the pernicious anæmia tubes but not in the controls. In the former the two hæmoglobin bands became dark or even black, whereas they remained comparatively light in the latter. These phenomena were observed even when a Pasteur-Chamberland L 5 or L 7 filter was used. In the presence of such a minute organism it is very doubtful, in Prof. Holst's opinion, if the rods and other bodies observed in the red blood corpuscles of patients suffering from pernicious anæmia represent forms of the causative virus. He has hitherto failed to induce the disease in animals by inoculating them with cultures of his filtrable virus, and he makes no definite claim as to the part it plays in the ætiology of pernicious anæmia.

[1] Norsk Magazin for Laegevidenskaben, January, 1931.

THE TEES SURVEY.

THE third annual report of the Water Pollution Research Board which has just been issued (H.M. Stationery Office, price 9*d*.) contains an account of the progress which has been made up to June, 1930, in the various researches undertaken by it. These include the treatment of sugar beet effluents, the biology of activated sludge, base exchange processes of water softening, and the biochemistry and biology of river pollution and self-purification. One of the most important and interesting researches conducted by the Board is the hydrographic, chemical and biological survey of the River Tees, a stream of moderate size, comprising about 71 miles of non-tidal and 25 miles of tidal water and having a flow found by gauging to vary from 100 million gallons or so a day in a normal summer to 500 million or more in high winter state. The average flow of the Thames over a period of 35 years has been found to vary from 500 million gallons in summer to 2400 million in winter, with daily variations from less than 100 million to about 10,000 million. The Tees is therefore of convenient size and it receives typical sewage and industrial pollution at various points, with subsequent recovery in some cases. Clearly the correlation of chemical and biological conditions with seasonal and hydrographical conditions in such a river should yield data of value in the study of pollution and its amelioration in streams of all kinds. This work has gone on for a year, and it has been decided to go on for a longer period if only to eliminate the effects of variations inseparable from observational as distinguished from experimental investigations.

In the Tees, as in many other tidal rivers, the fresh-water flow is, at any rate in summer when it is most needed, small in relation to tidal movement, in the region where the greatest pollution is found. In consequence a belt of highly polluted and poorly oxygenated water oscillates between Stockton and Newport at high water, and near the Transporter Bridge at Middlesbrough at low water. A very determined attempt is being made to connect the chemical data with the volumes and nature of the effluents reaching the river and the question whether

the absence or scarcity of living organisms in this region is definitely to be connected with pollution or with the inevitable great and rapid changes of salinity due to the cycle of the tides is to be investigated by parallel work on a similar but unpolluted estuary. Great mortality occurs amongst migratory fish-flounders, eels, sea trout, and salmon which endeavour to pass through the polluted zone on their way to non-tidal water. It is clear however from the permanence of invertebrates and algæ that the water between tide marks is never sufficiently toxic to destroy all life. There is very little seasonal variation in the life of the tideway although this is marked in the fresh-water portion. The upper reaches have been examined at 15 points from the falls at Cauldron Snout to Yarm. The results obtained so far show that the decomposition of organic matter goes on at a much more rapid rate in the hot summer months than at other times. J. Loeb found that the rate of photosynthesis doubled for a rise of 10° C., leading to the presumption that biochemical changes are affected similarly to other chemical reactions. The variations in the composition of river water, and of the gases dissolved in it during the 24 hours of the day, have been examined on several occasions and a photo-electric apparatus is being used to enable the changes observed to be correlated with the actual intensity of light. There seems to be a distinct correlation between pollution and the presence of the bloodworm (a dipterous larva) and other similar associations are suggested.

Little systematic combined chemical and biological work has been done in this country although many river surveys have been made, notably by the late Royal Commission on Sewage Disposal and more recently by the Fisheries Branch of the Ministry of Agriculture. These have, however, been mainly chemical. The neglect of freshwater biology is likely to be remedied when the newly formed Association for Freshwater Biology is really at work. In Germany rather more seems to have been done and methods have been worked out for collection of river flora and fauna. In the United States more attention has been given to lakes, which, forming closed communities, are in some respects (e.g., as to plankton) easier to examine. A recent sanitary survey of the River Murray, bounding the States of Victoria and New South Wales, although very thorough, was purely inspectional. The important investigation on the Tees, which appears to be fundamental research, will therefore be watched with the keener interest.

THE BULLETIN OF HYGIENE.

THIS bulletin came to life in 1925 in response to the need of concise summaries and reviews on all branches of public health and preventive medicine, and for six years it has been issued by the Bureau of Hygiene and Tropical Diseases under the direction of an honorary managing committee, appointed by the Secretary of State for the Colonies, of which Dr. A. T. Stanton, chief medical adviser to the Secretary of State, is chairman. Commencing with the first issue of 1931 an endeavour is being made to increase the usefulness of the bulletin by a regrouping of subjects, and by abstracting papers and journals as soon as possible after their publication or receipt. The principal headings are as follows: (1) Public health administration and social services. (2) Industrial hygiene. (3) Hygiene, diseases and accidents of special industries and occupations. (4) Vital statistics and epidemiology. (5) Port and ship hygiene. (6) Sanitation, including housing. (7) Food and nutrition. (8) Bacteriology and immunity. (9) Sanitary law. (10) Miscellaneous. (11) Book reviews. Certain experimental and laboratory work, including such things as new techniques, special research, and new disinfectants, which are of interest to the medical officer of health although still on trial, are to be noticed in small type in the appropriate sections. Rigid separation of subjects is of course not possible and cross-references will be added to help the reader. The abstracts and reviews are signed for the most part by names which carry weight in their department of science, and some of the abstracts are critical as well as compendious. It is, we think, doubtful whether the bulletin is as widely known as it deserves to be; it is one of the really satisfying things that reaches us, in scope, execution, and format, and there is no other periodical which covers the same field. It appears monthly and is distributed to subscribers for the sum of 21*s.* a year post free. Communications relating to the *Bulletin of Hygiene* can be addressed to the assistant director of the Bureau of Hygiene and Tropical Diseases, Keppel-street, Gower-street, London, W.C.1.

A PRIMER ON FRACTURES.

IN order to bring the treatment of the common types of fractures of the limbs constantly before practitioners the American Medical Association have appointed a Coöperative Committee on Fractures to organise lecture demonstrations. Each year a series of such demonstrations is given by a group of lecturers in a large number of centres. For the purpose of these lectures an illustrated folder [1] has been prepared depicting by drawings and short descriptions the main methods of dealing with various fractures. Surrounding the illustrations are a number of legends (perhaps aptly termed slogans) conveying important messages for the handling or treatment of patients, some of which, such as the necessity for taking radiograms before and after reduction, are constantly repeated. The demand for these folders has been so great that the committee decided to assemble them under one cover as a "Primer." The result is a useful publication. It is emphasised that the intention is not to standardise treatment, but to present what constitutes generally accepted methods of reduction and splinting and management of limb fractures. The illustrations are not always very helpful in practice, but the same applies to most books on fractures. The text contains much valuable instruction and direction in a simple, concise form which will appeal to many practitioners.

A TEST FOR SUGAR IN URINE.

ALL the usual laboratory methods for the qualitative estimation of urinary glucose in the urine require the aid of heat, but recently F. Leti [2] has devised one which may prove useful to practitioners because it works in the cold. The reaction is based on that of Nylander which gives a black coloration due to the precipitation of bismuth and in which a considerable quantity of heat is developed by the dissolving of sodium hydrate. The reagent, which is itself thermogenic, is prepared as follows: 10 g. of sodium hydrate

[1] Illustrated Primer on Fractures. Prepared by the Coöperative Committee on Fractures. Under auspices of Section on Surgery, General and Abdominal, and Section on Orthopedic Surgery, in coöperation with Department of Scientific Exhibit of the American Medical Association, Chicago: American Medical Association, 1930. Pp. 55.

[2] Policlinico, Practical Section, Jan. 12th, 1931, p. 49.

are fused with ½ g. of subnitrate of bismuth in a silver or nickel crucible by agitating the mixture; the mass then assumes a milky appearance. Care must be taken that the temperature of the hydrate during fusion is not too high; it should not be greater than the point of fusion, otherwise the mass will become reddish, yellow, or brown owing to the formation of various oxides of bismuth. The liquid mass is then poured out on a cold and dry surface, where it immediately solidifies. It is powdered quickly—for it is very hygroscopic—and kept in a closed receptacle. Whereas in Nylander's test the heat developed by the dissolving of the sodium hydrate in water is not utilised in any way, with the new reagent the heat is not lost but is only developed at the moment when it comes in contact with the urine. The test is performed by placing about 300–400 mg. (grs. 5 or 6, an excess being immaterial) on a microscope slide or watch glass, and adding one drop of urine. In the presence of glucose blacking takes place immediately; in its absence the powder remains white. Leti claims that this reagent saves both time and trouble since it enables anyone to ascertain the presence of sugar in the urine, although only in a qualitative sense.

BEIT BEQUESTS AND FELLOWSHIPS.

Sir Otto Beit, who died on Dec. 7th of last year, leaves a fortune provisionally estimated at over £3,600,000. He has given his executors the sum of £290,000 to distribute to public and charitable bodies, and the following are among the beneficiaries: King Edward's Hospital Fund, £50,000; The Royal Society, Guy's Hospital, the London Hospital, and St. George's Hospital, £10,000 each; the London Homœopathic Hospital and the Strangeways Research Laboratory, Cambridge, £5000 each, the Children's Sanatorium for the Treatment of Phthisis, Holt, Norfolk, and the Seaford Convalescent Home £2500 each.

It is announced in our advertisement columns that Sir Alfred Beit has been appointed a trustee for the Beit memorial fellowships for medical research in place of his father. Prof. T. R. Elliott has been appointed honorary secretary in place of Sir James Kingston Fowler, who has resigned, but remains a trustee. Sir John Rose Bradford has become a trustee in place of the Earl of Clarendon; Prof. J. C. G. Ledingham has joined the advisory board, and Sir Charles Martin, a member of this board since the foundation of the trust, has resigned on taking up work in Australia.

BCG AT THE PARIS ACADEMY OF MEDICINE

THE scientific calm of the Académie de Médecine was broken on Jan. 20th by Dr. Joseph Lignières, professor of bacteriology in the Veterinary Faculty at Buenos Aires, when he made a comprehensive attack upon the reputation of the Calmette vaccine. Judging by contemporary lay and medical comment in Paris it might be thought, he said, that B C G had received a final blessing throughout the entire world. The truth, however, was otherwise, and at no congress had any vote on the merits of the vaccine been taken—an act of prudence on the part of its sponsors. In particular he regarded as improper Calmette's employment of the total figures of infantile mortality; the report from Roumania of a fall in infant mortality from 25 to 2·3 per cent. was inadmissible. At the International Congress of Pædiatrics in Buenos Aires last year the proposal to extend B C G vaccination to all new-born children did not gain a single voice. After this preface Prof. Lignières remarked that evidence was steadily coming in to show that the B C G strain is not definitely fixed. He described the results of Dreyer and Vollum, published in our own columns,[1] as a confirmation of those of Petroff, and went on to speak of a long series of cultures, made by himself in 1929–30, in which, when egg was added to the medium, some of the cultures regained the property of producing progressive lesions in the guinea-pig. It was, however, a curious fact that the cultures which produced these lesions when cultivated anew on the same medium did not become more virulent; sometimes, indeed, the guinea-pigs which received them recovered from their lesions as after the non-virulent B C G. Turning to the Lübeck catastrophe, he remarked that Calmette, and the German investigators after him, were perfectly right in affirming that the classical B C G vaccine had nothing to do with it. The suggestion that non-virulent B C G had been mixed with a subvirulent human strain was, he said, not impossible, however unacceptable to laboratory workers; but he went on to make the remarkable statement that certain information collected at the Lübeck laboratory would suggest that the vaccine had been cultured at Lübeck on an egg-containing medium—which, if confirmed, would logically explain the tragedy. It would seem, he said, that Prof. Bruno Lange in discarding the possibility of spontaneous recovery of virulence was still impressed with the possibility of recovery of virulence from other causes. It was in this direction, said Prof. Lignières, that his own work was leading. Whatever the reason, the German Government continued to maintain its prohibition of B C G, and the same was true of Chile. Finally he came to his trump card—namely, the discovery by Dr. E. Hormaeche, professor of bacteriology at Montevideo, in collaboration with J. E. Mackinnon, of a means of conferring virulence at will on the classical B C G. In a paper published in the annals of the Faculty of Medicine Hormaeche had shown that in guinea-pigs previously inoculated with a streptococcus the B C G vaccine produced tuberculous lesions which after the third passage were progressive and tended to generalise. Once isolated this virulent B C G preserved its pathogenic qualities. Immediately he heard of this work Prof. Lignières obtained Hormaeche's streptococcus and permission to repeat his experiments, which his own results corroborated as far as they went. While he did not think that all types of streptococcus would augment the virulence of B C G, Hormaeche's observation would explain the occurrence of lesions in certain subjects after vaccination with B C G. This completed the long chain of evidence which justified him in counselling prudence and in reserving the Calmette vaccination for infants living in a tuberculous environment. The importance of the Calmette-Guérin discovery was patent, but before the vaccine became universal it would have to be rendered absolutely inoffensive. Prof. Léon Bernard having replied with some asperity that no congress ever took a vote on a scientific discovery, that Prof. Lignières himself had had a share in the employment of B C G to immunise cattle, and that the veterinary commission organised in Paris by the League of Nations had recognised the absolute innocuity of B C G, Prof. Lignières refused to surrender any part of his strategic position.

WE regret to announce the death on Monday last of Mr. A. G. R. Foulerton which occurred at his residence, Morpeth-terrace, S.W., after a short illness.

[1] THE LANCET, Jan. 3rd, p. 9.

A POST-GRADUATE COURSE

MOTIVES AND MECHANISMS OF THE MIND.*

VI.—LAW: THE RÔLE OF THE FATHER.

IMAGO: INBORN FEELING PATTERNS.

THE principle that the individual is more than the sum of his experiences has already been stressed. Apart from those individual inborn characteristics which later give rise to the uniqueness of personality, there are certain instinctive and emotional tendencies which are to be found deep-rooted in us all, originating not in our own experience but in a distant racial past, and yet actively causative of much subsequent behaviour. It is the purpose of this chapter to discuss, in particular, that inborn "feeling pattern" of which the father is the object. Does it seem improbable that there should be in the individual a feeling pattern prior to, and independent of, actual experience of the father? But when we consider that feeling patterns are born in the individual as the result of the summation of racial experience, we realise at once that the father must have been one of the commonest of all experiences.

We may very broadly divide the feeling patterns which we are going to consider in this and the next lecture into three—namely, "feeling about the Father," "feeling about the Mother," and "feeling about Self." These three have arisen as the result of *racial experience* and, in the individual's lifetime, are only subject to *secondary modification*.

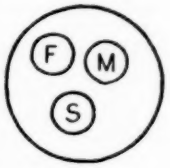
These "father" and "mother" feeling patterns are referred to as father and mother *imago*, and contain much material of a very primitive and unconscious origin. "Father imago" is the source from which savage and civilised, child and adult, derive their conceptions of gods and devils, magicians and giants, priests and medicine-men. Associated with these primitive, archetypal figures is much of mystery, majesty, and power. The original father imago feeling pattern is subject to modification by experience of the actual objective father or father-surrogate, but it is only upon this primitive pattern that ultimate experience reacts by a process of secondary modification. It is very important to realise this, because of the consequences which result where the individual has in childhood lacked the influence of a father, who may have died before birth or in early infancy. If there were no father one might expect there would be very little of the "feeling about father," but this is far from being the case. It is as if the absence of a real objective father has permitted a free and unfettered development of the imago pattern, and it seems to be the fact that fatherless individuals are more susceptible to the development of father imago feelings than those in whom the actual experience of the father is able to cause their modification. It is also necessary to realise that actual experience of a real objective father may still permit in some cases of *un*modified imago reactions. The experience of father during the individual's lifetime may be entirely "good," if the father is happy enough to deserve that description. The individual reaction, however, to this experience of a good father may be, and very often is, of an unfortunate and undesirable kind. It is a matter of common experience that good fathers often have children who fail to come up to the standard which their fathers have set them. This is due to the development of imago reactions which interfere with the imitation due to suggestibility which might be expected.

Although this factor of suggestibility is important, it does not entirely account for individual reactions to experience of the father. Of the two, it is probable that imago reactions are the more important. These imago feelings, which have been recapitulated within the individual and become modified by experience of the father or father-surrogate, then give rise by extension to certain important derivatives, which comprise the whole conception of "*authority*" and "*law*." The feeling which the individual develops with regard to authority and law is the result of the modification which has taken place in imago feeling through his later experiences. Father imago is therefore something independent of father, deeper and greater than experience, and the derivatives of father imago extend beyond the individual's attitude towards his father, determining his attitude towards all those who are in authority and his opinions on various subjects, especially those of religion and politics.

IMAGO AFFECTS.

In the diagram (Fig. 1) the outer circle represents the vidual as a whole. The three inner circles represent his feeling about his father (F), his feeling about his mother (M), and his feeling about himself (S). We are again dealing with the primary concept of the eternal triangle, and again, for the sake of simplicity, we will limit our consideration to the male. It may be stated at once that, from clinical experience, it is found that as far as "S" is concerned, his inborn imago feelings are according to the primitive pattern of the desires and fears of the *Œdipus complex*. What then are these primary "affects" or feeling tones concerned with father and mother, but independent of actual experience of them? They may be discussed under the headings of inferiority, power, guilt, retaliation, and fear.

FIG. 1.



A. *Inferiority.*—The standards of measurement taken by the unconscious are crude and simple, and the effect of stature and age is of great importance in deciding the degree of superiority and inferiority. The infant born into the world is in a position of extreme inferiority. He is so small, whereas the other members of the circle in which he finds himself are relatively so large, especially father. He is so young and by contrast father seems so old, and by that so much superior. He is so weak, father so strong, and on every hand the superiority of father is demonstrated. The consequence is the development, so often and so extreme as to become an inborn pattern, of a feeling of *primary inferiority*, especially felt with regard to father. This factor of inferiority is one of the most important components of father imago feeling. With this is associated the feeling of *jealousy*: "because he is so much stronger than I am, I feel he can take away from me all that I most want to keep for myself."

B. *Magic Power.*—Associated with this feeling of inferiority is the sense of power by contrast which father possesses. Comparatively, father is *omnipoten* and the contrast is one which endows the father

* A course of 12 lectures delivered under the auspices of the Tavistock Clinic, Tavistock-square, by Dr. E. Graham Howe during the autumn session of 1930. Earlier lectures of the series have appeared weekly in THE LANCET since Jan. 3rd.

figure with all the qualities of *magic*. The second factor in father imago feeling is therefore the desire for magic power, through which may be obtained the superiority of father. Magic power is omnipotent and effortless, a matter of magic carpets, seven-league boots, miracles and electric buttons. With this desire for power, "to be like father," is associated the feeling of *envy*.

C. *Guilt.*—To what extent does feeling about mother have an effect on feeling about father? A simple statement of primary feeling tone may be made as follows: "I love my mother. I want my mother for myself. My father has my mother, and he is omnipotent. If my father knew I wanted my mother, he would be angry, and would punish me." This is the familiar pattern of the Œdipus complex, with its inevitable feeling of conflict and guilt. The third factor in father imago feeling is therefore *guilt*.

D. *Retaliation.*—The wish to retaliate is a consequence of wish-fulfilment frustrated and is accompanied by feelings of envy ("he has got want I want") and jealousy ("I am afraid of his taking from me that which I have"). The wish to *retaliate*, to get even with the father, is the fourth factor in father imago feeling.

E. *Fear.*—With all his invested superiority, power of magic, and omnipotence, added to the feelings of rivalry, frustration, envy, and jealousy, and the wish to retaliate, inevitably goes the feeling of fear. The fear may be of being crushed or lost, but most important of all is the *fear of being punished*. Fear of father is the fear of father's power and father's punishment, and is particularly connected with punishment for the guilty wishes associated with the mother.

These are the primary affects which together make up the pattern of father imago feeling and which become secondarily modified by the actual experience of father or father-surrogate. They are essentially *unconscious* in origin (i.e., merely basic undifferentiated feelings) but they may later become partly rationalised. From this more or less modified primary pattern much that is of importance to individual wish-fulfilment is ultimately obtained, the detail of which will be developed in successive paragraphs.

THE FATHER AND WISH-FULFILMENT.

It is quite obvious that a father figure of this type is going to be an object of fear and conflict, rather than one of wish-fulfilment. He stands badly in need of a compensatory corrective, in order to give stability to this primitive world of desires and feelings. This presents only a slight difficulty, because phantasy is always ready to step in to correct the deficiencies either of reality or a too morbid imagination. The *compensatory father phantasy* must have the following attributes in order to be satisfactory.

(*a*) He must be *personal*, possessed of as much familiar form and substance as any earthly human.

(*b*) He must be *beneficent*, possessed of all loving kindness.

(*c*) I must be his *chosen one*, raised up above all others in a very special and irrefutable relationship of absolute superiority.

(*d*) He must be *omnipotent*, in order to overcome all the doubts and fears of reality and imagination.

With such a compensatory phantasy, it becomes easier to withstand the shocks of experience, the deprivations of reality, and the fears of imagination. It is badly needed, and its real existence will be as stoutly defended.

AFFECTS TRANSFERRED TO ASSOCIATED SIMILARS.

Father-surrogates, for the purpose of modification of father imago feeling, are many. Some, and most probably the first, are elder members of the family, perhaps elder brothers, uncles, or any adult in immediate authority. Later, when the boy goes to school, the father-surrogate, and therefore the object of imago feeling, is the schoolmaster. A very important member of this series is the preacher, and others are the authorities of politics and law. The power of the law and of the policeman is thus imago power and is not due so much to any individual prestige, as to this inborn feeling tendency. All those who may be invested with authority at any time, large or small, have become linked with the authority series and the feeling attached to them is a modification of imago feeling. Income-tax collectors and ticket inspectors derive their power and authority from the same source. It is not from themselves, but from that which they represent *in us*, that they derive their importance.

A further and most important extension of the father figure is the king, president or tribal head. It is not for himself alone that he is loved and feared, but because unto him has been extended the imago feeling. He is the source of pomp and power, to be loved in his mercy and dreaded in his wrath. The feeling which a people may have about their king is largely independent of his personal character and individuality. This is in some cases fortunate and makes his position stronger and happier than it might otherwise have been. But the retaliatory motive associated with unconscious imago sources often becomes transferred to a person in high authority, who may be entirely innocent so far as the individual's imaginary sufferings are concerned. These retaliatory and antagonistic forces associated with father imago are liable to find expression in acts of parricide, regicide, and anarchy, by the simple process of the transferred affect, and sometimes to the grave danger of the innocent representative of authority.

The most important of all derivatives of father imago feeling is the conception of God. There is a tendency to extend the projection of father imago feeling to the utmost, and understanding of this mechanism is of the greatest importance to those who are interested in religion. It is surely most desirable for us to try to make some distinction between our *ideas of God*, which are to a greater or less extent derived from these unconscious sources, and those characteristics which may perhaps belong to the *true objective nature* of God, quite independent of our imago feelings and compensatory wishes. It is possible that our subjective unconscious feelings and rationalisations may coincide at some point with the objective attributes of God, but it is certainly most unlikely that the coincidence will be identical. Father imago feelings, though certainly inspired from one part of their source, are extremely primitive and crude from another, relating in fact to oft-repeated and very earthly experience of mortal parenthood, which is a fact that still waits for general recognition.

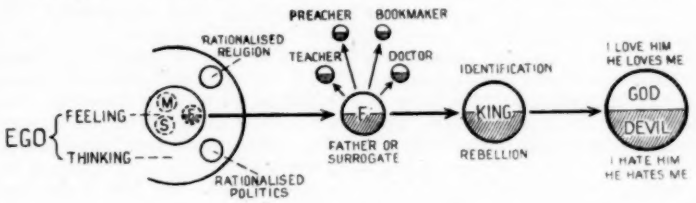
Doctors owe much of their authority to imago reactions. They are the modern "medicine-men" to whom the general public turns in search of omnipotence and magic. It may be inferred that to some extent at least the medical profession is not averse to this invested prestige and the added power bestowed upon them by this "transferred affect." It is certain, however, that unconsciousness of the effects of imago reactions leaves much of their work some-

times misunderstood, and it may be liable to suffer in consequence.

As an illustration of the diversity of objective experience associated with the subjective imago feeling, we may mention that another object to whom it becomes attached is the bookmaker. The connexion may not at first be obvious, but the bookmaker, as an object of wish-fulfilment for these unconscious feelings, in his imaginary benevolent omnipotence may perhaps be placed half-way between the doctor and God!

It will be seen from the above that many of our beliefs and opinions are derived from unconscious sources associated with imago feeling, and their origin is therefore very different from what our subsequent rationalisations would have us believe. A great simplification of our understanding of the many constituent threads and facets of individual life occurs when we link them up with their simple unconscious sources. Take, for example, religious faith, political opinion, and attitude towards authority. These are all found to be allied in their basic feelings in any one individual, and are therefore similar in type. On the right wing is the staunch maintainer of the tradition of the English Church, upholding also the tradition of conservatism and the rightness of things as they are, and the wrongness of all that is new and young. The single pattern to which the "conservative-Church of England" type conforms is that he is anxious to *maintain authority*, the authority of parenthood, the State, the King and God. This pattern will be referred to later as "father indentification," and its exponent will tend to be as authoritative himself as is the authority of that system which he does his utmost to maintain. On the left wing stands the *rebel*, the extreme rebel being communist, atheist, and anarchist, who is *against all government and authority*, and in fact every system which represents law and order. He is against his father and the authority of fatherhood; he is against the king and the authority of the State; and against God and the authority of divine rule. He sweeps them all aside with a single rebellious gesture. There is no paternal authority (hence free love), there is no king (hence varying degrees of republicanism and anarchy), there is no God (hence varying degrees of atheism, rationalism, &c.). All are an example of *unconscious wish-fulfilment* and have no real relation to the domestic, political, religious, or economic circumstances. They are material for psychopathology, not for argument—as is further shown by the amount of undifferentiated "affect" which argument is liable to arouse.

Fig. 2.—*The Split Father Imago: Reactions and Derivations.*



Split Imago: Good and Evil.

If we refer again to those feelings which form components of father imago (Fig. 2) we find two types which are very different in character. These are the feelings, broadly, of *love* and *fear*, and being so different in character they give rise to two entirely different series of derivatives. From the love feeling is derived a conception of a benevolent God full of protective indulgence, and in general a phantasy world of blissful wish-fulfilment closely connected with the primitive conception of "Providence." Providence is a personal, more or less anthropomorphic, entirely beneficent figure which "counts the hairs of our head" and "without whose knowledge no sparrow falls to the ground." "We are his chosen people," as a rule mainly interested in our unique singularity, anticipating with delight our final adoption into eternal life in a heavenly kingdom where we shall live happy ever after. It is all rather like the fairy story which expresses the same phantasy of personal wish-fulfilment and, as in the fairy story, when we read a little further, we find that there is another and quite opposite evil genius to contend against.

God's beneficent omnipotence is frustrated on every hand by the evil and punitive machinations of the devil and his lesser satellites. Again the figure possesses a personal and anthropomorphic detail, and into his character is projected all that we feel of evil and fear. His home is the home of punishment, every sin painted with all the gloomy details of sadistic imagination. He reminds us of the giants and ogres of fairy stories and the threats of the punitive policeman of old-fashioned and ignorant nursery maids.

The Jehovah of the Old Testament was a projection in crude simplicity of the father imago archetype. In him were combined the two conceptions of beneficence and punishment, fear being stronger than love. He was the authority who ruled like the patriarch of old with a rod of iron, claiming an eye for an eye and a tooth for a tooth, and the right to punish "the sins of the fathers unto the third and fourth generation." He was a composite figure, unconscious in origin and latterly tending to be split into a more benevolent God and a more malevolent Devil, the fear aspect becoming progressively less important with the emotional development of the race.

It is interesting and important to trace the same tendency for imago feelings to split into good and evil, in the other derivatives which have been previously mentioned. In general the tendency is first of all to idealise authority (i.e., wish-fulfilment), to feel that now at last the perfect one has been discovered, be he a hero of politics, the army, the stage, or any field in which an individual may be generally admired. The fickleness of the general public is a byword and the popular hero of to-day is despised or forgotten to-morrow. It is as if imago has turned its other face and all ill has taken the place of all good. The hero who yesterday was praised and sung to-day is crucified, and the cruelty and unreason of the change is the measure of its unconscious and infantile emotional source.

The doctor will here be specially interested, as this mechanism closely touches his own professional status. His patients wish to regard him as omnipotent, benevolent, and uniquely interested in themselves, and they may feel at first that he is all that they wish him to be. But suddenly the patient may go elsewhere, and for the slightest excuse is ready to turn and blame unreasonably the authority whom he had previously so enthusiastically praised. Imago thus easily may turn his face to show the other side.

The status in public esteem of the quack is due to the same mechanism. There are many people who characteristically prefer quacks and these will be found on the whole to conform to the rebel type. It is the price that authority has to pay for its imago power, that it is always liable to stimulate the rebel motive, even in its most devoted adherents. However devoted they may be to the medical profession, the general public has a warm place in its heart for the quack for two reasons. The rebels and faddists will like him because he is opposed to authority, and the rest because he claims the powers of magic and omnipotence—and that is what the world is looking for.

This desire on the part of the public for "omnipotence" and "something for nothing," earns the bread and butter, and all that he gets besides, of the bookmaker, and anyone who likes to claim omnipotence is welcome to it, although his day may be shortlived. Disappointment, however, does not always teach the lesson which it should, as is shown in the case of the gambler. As a rule, *the unconscious does not learn much by experience.* The idea of omnipotence may be regarded as one of the most important diagnostic signs of infantile wish-fulfilment and unconscious motivation. There is no evidence for it in objective reality, and yet it is the object of fear and wish-fulfilment. *The fear of, and wish for, omnipotence is one of the most important signs of immaturity and is always associated with that failure of growth which is a cardinal factor in the development of neurosis.*

IMAGO REACTIONS.

It may be stated as an axiom that the *goal of wish-fulfilment of the son is to become the father.* This is true biologically and psychologically. It may be obtained in one of the following three ways: (*a*) identification, (*b*) rebellion, (*c*) growth.

It is perhaps interesting to recognise how these three alternatives are the only methods by which change can be affected, as long as we understand the conception of growth to include both backward as well as forward movement.

Identification is change by means of adaptation of the external form, and is a process of *imitation.* It may be related to the "teaching" method, as distinct from the "educative." The distinction is a very important one, as "teaching" is typically a process of *imitation* by which something which is outside the individual is pushed into him more or less successfully, when there was nothing of the same kind inside him before. The identification method is that primarily emphasised by all authoritarians, whether educational or domestic. It is obviously not sound psychologically, although often economically useful, as it produces the desired result more rapidly and with less expense of effort.

Rebellion, on the other hand, is essentially a change by *revolution.* Unlike identification, which is a change from without inwards, rebellion is a change from within outwards, but it is of the type of turning upside down or inside out. When a penny is turned over on the table it is still the same penny, although it shows a different face to the world. Rebellion and revolution are the most sudden of all changes, but of this method may be said "Plus ça change, plus ça reste." It is the method advocated on the one hand by political revolutionaries, and on the other by a certain type of religious enthusiast, and in the latter case the "conversion" is liable to be psychologically a doubtful one.

The third method of change, *growth*, is the only one which is psychologically desirable. It is change from within outwards, due to the spontaneous creative self-expression of the individual. It is slow but it is sure, because it is based like a pyramid upon the widest possible foundation. It is the only psychological ideal, because it is biologically sound and individually free.

It is now necessary to relate these three methods of change to the conception of imago which has already been described. It is by identification, rebellion, and growth that the son strives to achieve equality with father imago.

IDENTIFICATION.

In this method, the son strives once and for all to be the father in all his power and authority, and seeks to invest himself with magic power. In every way he tries to support authority and at the same time to identify himself with it. The psychological attitude is essentially that expressed in the word "conservative," with all that it means for the maintenance of the *status quo.* In general, the attitude is "My father, right or wrong." The extensions of the father principle all possess the same transferred affect, and the same feeling therefore becomes applied to God, king, country, doctor, teacher, and so on. Authority in every form and of every kind has to be maintained to the utmost. The law of the family, of the Church, and of State is the law of external authority, of duty, and of "ought." But herein is the important factor—that all these authorities owe their importance to the fact that they represent "me," because I am identified with them.

Father imago feeling is a very important component of conscience, especially for those who are identified with it. It is the standard of conduct, the measure of duty and the "ought" by which they live their lives. But this factor of conscience is very different from the "still small voice." It is liable to be an inexorable argument which shouts, rather than whispers, "I must, I ought." It is important to realise the extent to which it is an internal factor in spite of the fact that it usually has an external reference. It does not matter if the father is dead, or the individual living on a desert island free from the comments of external authority. His authority is always within himself, in his father imago feeling, and it is the inner law that he must obey. The conception which we are outlining of this dictatorial and compulsive internal conscience due to father imago identification is similar to Freud's conception of the *super-ego.*

What is the harm of super-ego and father imago identification? It is largely caused by the feeling of fear which it engenders and the lack of opportunity for individual development which it causes. This is the conscience which "makes cowards of us all" and keeps us children. It is impossible both to grow from within outwards in spontaneous development, and to identify oneself with a standard to which one has not attained. The wolf remains the same whether it wears sheep's clothing or not, and "I" remain the same whether "I" am identified with my father or not. There must always be conflict between my own individuality and the authority pose which I have adopted. Father imago identification involves a repression of the opposite mode of change—i.e., rebellion. The spontaneous individual factor remains undeveloped, in spite of the assumption of an external form of growth and power. The consequence is that there is a serious gap between "what I feel I am" and "what I feel I ought to be," and it is this gap which many psychological mechanisms are required to fill.

The individual who assumes imago authority, who is inexorably strict in principle, and who commands others without understanding the limitation of his own individuality, is no more than a child dressed up in adult clothes. In many ways he shows his immaturity and not the least in that he cannot stand at all without someone to lean on, usually the person of a woman (mother substitute) whose services he can neither dispense with nor appreciate.

REBELLION.

Where identification seeks to preserve the *status quo* and the integrity of external authority, the rebel attitude seeks with a broad sweep to eliminate both history and law. It is as if the world is to start all over again "now," with "me." No past, no law, no father, no church, no God to limit "me." The rebel is as much against the law, according to a single feeling pattern, as the person who is identified with authority is for it. The rebel is a "free thinker" (or so he supposes), an atheist and an anarchist, and has no use for the sanctity of the home, which involves the limitation both of love and power. But the rebel is firmly and inevitably fixed upon the horns of a dilemma of his own creation. He says there *is* no law, there *is* no authority, and in doing so he denies his own right to existence. In striving to eliminate the external power he forgets that he is also eliminating his own internal power and yet it is that same power which he is all the time striving to attain. The rebel has essentially a self-destructive psychology, "cutting off his nose to spite his face," and denying the existence of that which he is at the same time trying to achieve. He does not understand that external and internal authority systems are primarily one and the same and not to be thus easily dissociated. *Authority outside ourselves is only the external reference of our internal wish for the goal of manhood and maturity, and to deny its existence is at the same time to deny our own life's objective.* Hence the destructive and ineffective psychology of the rebel, which is liable to create chaos in its search for the new and perfect system. A point to note about the rebel's psychology is its close affinity with that of the "diehard" Conservative. Both are seekers after ultimate and exclusive power, and in their behaviour and point of view they have much in common in spite of the opposition of their attitudes.

Rebellion is part of the normal psychology of adolescence, and its biological utility, as a passing phase, cannot be denied, but it must essentially be limited to a passing phase. It is the means by which the shackles of authority and the traditions of the past are thrown off, but it must be followed by a period of spontaneous growth. If it remains fixed, the rebel is against everything, and all his objectives must be different from those of the herd. He is against the government, he is the crank and faddist in religion, politics, medicine, and every aspect of life. He can never work in any team and never coöperate except from the motive of his own egotism. If his government should attain power he is still against it, and becomes the government's left-wing, which is a more painful thorn in its flesh than that which any other party could impose. The rebel is the enemy of all that was and is, and his own worst enemy as well. He must grow in individual spontaneity, in coöperation and herd-centricity, or remain for ever outside the pale of social and individual progress.

The essential conflict of the rebel's psychology is that while on the one hand he wishes for completeness of his own authority, on the other he fears, hates, and denies its existence. For the external and internal authority systems are fundamentally one and the same.

THE INFERIORITY COMPLEX.

The pattern of imago feeling is modified by experience of father. What experience of father is going to give rise to the development of what is called the inferiority complex? In general it may be said that any exaggeration of the power and authority of the father, and any exaggeration of the fear and weakness of the individual, will give rise to inferiority complex reactions. The power and authority of the father may be impressed upon the individual in various ways. If the father is one who has unduly identified himself with authority he will tend to use it with all the display and autocracy which he can assume. He is the father whose word is law and whose example is set as the domestic ideal. His is the voice which orders all family councils and his is the dreaded punishment which assumes the omnipotence of Jehovah. He is constantly in the mood of "England expects" (and is himself identified with England) and he is usually expecting far more than he has any right to do. His son (because he is his son and part of his undifferentiated ego) must be, or ought to be, both a double blue and a double first. In this atmosphere the father imago feeling and super-ego are being inflated day by day at the expense of the development of individual spontaneity. An ever-widening gap is growing between "What I feel I ought to be" and "what I feel I am." "Compared with this all-mighty father I feel smaller than I really am." Our measures are all a matter of relativity.

There is another type of father who presents an even more difficult problem, and this is the good and uniformly successful father. In his life he has done well and made good. He may in fact be as near being a good or perfect man as he can possibly be. It is difficult to explain to him that herein lies the danger of his parenthood, because of the difference relatively between all that he is and all that his small children feel themselves to be. He is always right, they are always wrong. He is always good, they are always bad. He is always big, they are always small. It makes no difference that he is really good and successful without any bluffing or self-deception, the problem remains the same, of a relative exaggeration of the already great difference between father and son.

Other problems arise when the father is a drunkard or bully, or when separation or divorce take place between father and mother. This must produce conflicts and crises of great importance in individual feeling. The father must be the ideal and the first measure of wish-fulfilment. If experience of him conflicts with the wish to be like him, stresses and strains of varying intensity are the result.

If we refer to the first diagram of this lecture, we can put the problem of inferiority feeling or self-respect in a very simple ratio, namely:

$$\text{Self-respect} = \frac{S}{F}$$

The difference is a relative one. The smaller is S (i.e., my value of myself), or the larger is F (i.e., my feeling about my father), the smaller is the fraction. The consequence is "I feel I ought to be so big and good, but I feel I am so small and bad," and this is the basic conflict of the inferiority complex.

It may be put mathematically. For the purpose of my own individual spontaneity I am in fact 1, but relative to my feeling about father I feel myself to be only $\frac{1}{2}$, and I feel my father's measure of what I ought to be is $1\frac{1}{2}$. I therefore try to be

and feel I should be 1¾, while all the time I feel I am only ½. This is the psychology of over-compensation with all its mechanisms of conceit, snobbishness, priggishness, bullying, &c. It is based fundamentally on a false value of myself, for I am not really a ½ but 1, and it is not my job really to imitate my father, but to be myself.

THE INDIVIDUAL SOLUTION: GROWTH AND AT-ONE-MENT. (Fig. 3.)

Growth can only proceed by the slow process of evolution, and although the change may sometimes appear to be sudden, if the "conversion" is a true one, it only comes at the end of a long preceding evolutionary phase. Growth must proceed from an inward, individual, and spontaneous development until the authority of maturity is attained, after a long period of effort, failure, disappointment, modification, and learning by experience. There is no royal road or short cut. Identification and rebellion pay for their apparent success with all the necessary props and mechanisms which are required to support it. Growth that is spontaneous and free is a gradual development of the individual source of power and authority, attaining progressive freedom from the feelings of fear, guilt, and inferiority. Ultimately there may come the identification with father imago which this time is true in fact. There is a real "at-one-ment." The individual becomes the standard of his own authority, he expects no criticism other than his own, and fears no punishment other than that which he himself can give. The external and the internal authority have become as one, and they are a unique possession of the individual, derived from his own experience.

FIG. 3.

The biological symbol of development and maturity is fatherhood. "I am the father, now the power and authority are mine." It is not necessarily true that paternity is equivalent to psychological maturity, but it is at any rate a form and symbol of it, which is of great value in increasing the individual's sense of responsibility and self-respect. Much adolescent enthusiasm, which previously spent itself in rebellious politics, has later become transferred to acquiring the power and property of paternity.

The Ideal Rôle of the Father.

From what has been said already, it should be possible to derive some positive suggestions as to how fathers should behave towards their children. There are certain dangers which should be obvious. The first point to realise is that, quite apart from experience of father, the individual possesses certain feeling patterns and potential mechanisms, of the existence of which parents must be consciously aware. It is too easy to make children feel afraid, guilty, and inferior, because these are their primary feeling patterns. But if we are to help them to grow, they can only do so by getting rid of their feelings of fear, guilt, and inferiority, and this they will never do if experience tends to exaggerate rather than minimise these feelings. Fathers who have achieved their own power sense through identification or rebellion will themselves possess a feeling of inferiority, which they will be prone to defend by the assumption of exaggerated authority, thereby inducing inferiority in others, especially their children. This accounts for much destructive criticism on the part of elders who should be betters, but in this respect they certainly are not. Fear, guilt and inferiority, sarcasm, punishment, and the assumption of superior wisdom, are all injurious to the sensitive material of individual character.

A large part of the trouble is due to the crudeness of our measurements and values. Because A happens to be 4 feet taller than B and 30 years older, he is not necessarily superior to B, however much he may feel so. Years and stature are not the true measure of personal superiority, although B will be the first to feel them so, and A will be prone to make as much capital as he can out of the difference. For all his advantage of height and years, the only true way of correlating A and B is to realise that they are both pilgrims on a long road with many turnings and still far from their goal. Measured by the years of racial evolution and history and by the possibilities of psychological development, there is not so much difference after all.

It is absolutely necessary to preserve the integrity of individual values as being personal and unique. There are far too many factors in heredity and personality for any father to have the right to dictate as to what his son should be or do or think. Development must be from within outwards according to individual spontaneity and wish-fulfilment, and this must not be deterred by the assumption on the part of external authority of the right to interference with and dictate to individual freedom. The easiest way to rule is by stimulating feelings of fear, guilt, and inferiority. The best way to rule is by coöperation, equality, and freedom.

It is perfectly true that there are occasions when individual freedom is inclined to behave in a way which deprives others of equal rights or involves undue risk. It is on such occasions that parental responsibility is justified in asserting itself, but even then it must be on the assumption that there is, latent within every individual, a wish towards social coöperation and harmony of mutual although independent adjustment. The father who is wise will not need to come down to his children, because he will realise how nearly they are on a level. He will feel that his influence is best exerted as a coöperative companion, and worst as a punitive patriarch.

ILLUSTRATIVE CASE.

CASE P.—Aged 50. Married. No children. Clergyman. Complained of depression, dissatisfaction with his job, a feeling that he was being neglected and ill-treated, and compulsive phrases that he could not control, such as "There is no God. Damn God. Damn the church."

Family history: He was the youngest of 13 children. His father died when he was six months old. His mother was still living.

History: When his father died, his mother lavished an undue proportion of her affection on her youngest child, whom she called "her Benjamin." He actually shared his mother's bed until he was 7 years old. At this time he stated that he felt an extreme degree of guilt, especially with regard to his elder brothers and uncles. He was terrified of meeting his mother's brothers, because he felt that they were accusing him of something terrible, but he did not know what it was.

At school he was laughed at by his companions as "the boy who slept with his mother," about which he felt both extremely guilty and inferior. At the age of 12 he was asked what he proposed to be. He said he intended either to be a carpenter or to go into the church. (The association of the two at once suggests Messianic identification.) His mother was very anxious that he should go into the church, as she was a very religious woman of extremely high ideals. He accordingly embarked on a university career at a theological college, where he was regarded as being one of the most promising students. In his final year he was expected to get the Gold Medal, for which he had only one serious rival, who was of an entirely different temperament from himself, being famous in the college for standards of behaviour with women and drink which might be thought prejudicial to a successful theological career. However, his rival

was awarded the Gold Medal, and he was announced as being second. A week later he was told that there had been some error in the marks and that in fact it should have been a tie, but the authorities had decided not to change the award. He felt what he had always felt—that the authorities were against him and were punishing him for something that he had done wrong. He said, "I felt despised and rejected." He attributed his failure to the fact that during the strain of working for his examination he had suffered from occasional involuntary insemination and that God had punished him for this guilt by depriving him of the award.

His suffering was so extreme that he had a nervous breakdown and was incapacitated from further work for a period of three months. He then went into a parish, but he was never happy in his parish work because, on the one hand, he was terrified of meeting the bishop, as he felt he was always criticising him and he did not know what for, and, on the other, he felt that his congregation were doing the same thing. He said he felt that something was always about to come to light of which he would be ashamed and which would ruin him. He felt at times intense resentment and jealousy, knowing that he was not doing as well as he should and feeling that other people were being preferred whilst his merits were ignored.

At the age of 47 he married a woman who was older than himself and whom he described as being like a sister to him. He was unable to have normal sex relations and this added to his sense of guilt and unhappiness. But before he was married he felt that he could never take this step and again an obsessional phrase came into his mind which he could not explain. It was "I am already married to a woman with 13 children." (To the unconscious the actual ceremony of marriage is not so important as having shared a bed with a woman for a period of seven years.)

The phrases of which he had complained: "Damn God: damn the church: there is no God" crept into his mind involuntarily and he was afraid they would do so when he was in the pulpit. He said that a phrase of General Gordon's was constantly in his mind with slight modification. "Whatever facts shall come to light I *always* shall be blamed." Finally, in pronouncing absolution at the end of the service to his congregation, he said that there was another alteration of what he should say that was always trying to trip his tongue: "Father, have mercy on all our *sons*."

This case is particularly interesting, as it shows the effect of the lack of experience of a real father on the unmodified development of father imago pattern and mechanisms. The mechanisms were free to develop without modification, and this again was exaggerated by the extremely unwise conduct of his mother in permitting him so much emotional intimacy with her. He developed both the wish to be the chosen one, perfect and immaculate, and also a terror of the punitive aspect of unjust authority. It was not to be wondered at that in spite of quite exceptional ability and goodwill, his life was largely ruined by the emotional conflict derived from experiences in infancy and early childhood, over which he had no responsibility.

SPECIAL ARTICLES

YELLOW FEVER AND AIR ROUTES.

A NOTE has been presented by Colonel S. P. James, chairman of the Yellow Fever Commission, to the Office International d'Hygiène Publique on the results of recent researches in the prevention of the spread of yellow fever. The full text is published in the *Bulletin Mensuel* for December, 1930, and the object of the writer is to dwell on the important relation which new knowledge bears to the manner in which yellow fever should be dealt with under the forthcoming Aerial Sanitary Convention.

Methods of Spread.

This matter he considered under three headings: (1) notification and diagnosis; (2) the causal agent and its infectivity to man and to mosquitoes; and (3) the course and duration of infectivity in human cases and in mosquitoes. Colonel James writes:—

1. *Notification and diagnosis.*—According to Article 1 of the International Sanitary Convention of 1926 and Article 14 of the draft of the proposed Aerial Sanitary Convention, the notification of a recognised case of yellow fever is the signal for taking measures to prevent spread of the disease. But a well-confirmed result of recent research is that some infective cases of yellow fever present such slight and atypical symptoms that it is impossible to recognise them.

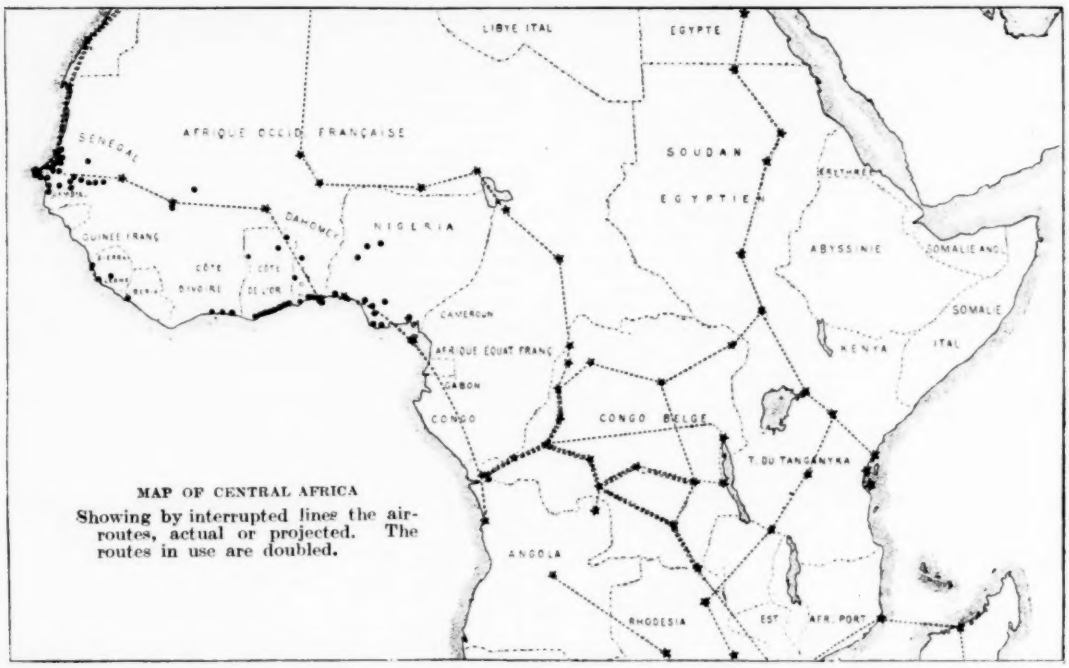
2. *The causal agent and its infectivity to man and to mosquitoes.*—At the time of the International Sanitary Conference of 1926 it was believed that the specific germ of yellow fever had been discovered. Now we have to admit that we know so little about the causal agent that we have to refer to it under the general term "virus." This alone is sufficient to require that prophylactic regulations should be placed in a different category and should be of a different kind from those of plague and cholera which, even in the absence of clinical cases, can be recognised by their specific germs. As yet we do not know much about the "virus" of yellow fever, but what we do know makes it necessary to change existing views on the mode of transmission and the infectivity of the disease. One of the most important recent experiences is that persons may become infected from patients without any intervention of mosquitoes. This has been proved recently in England by the occurrence of cases in circumstances where the intervention of mosquitoes could be entirely excluded. In these cases it was impossible to decide exactly how infection was acquired, but it was believed that there must have been contamination of the fingers or hands with blood containing the virus in sufficient quantity to penetrate the unbroken skin. An analogous mode of transmission between mosquitoes without the intervention of a human host seems also to have been proved. It appears that the virus can survive in the excreta of mosquitoes and that other mosquitoes can become infected by direct contact with these excreta or with the mosquitoes themselves. If this is so it explains why an area may continue to remain infective for a long time even in the absence of human cases of the disease. Another new finding which is important in relation to prophylactic measures is that other mosquitoes than *Aedes ægypti* have been incriminated as transmitters of the infection.

3. *Course and duration of infectivity in human cases and in mosquitoes.*—It has been proved in laboratory work with monkeys that the blood is infective during the incubation period of the disease as well as during the early period of the attack, and it is considered on theoretical grounds that the same must be true of human cases. The blood of human cases ceases to be infective within three days of the commencement of febrile symptoms, but exceptionally its infectivity persists until the fourth day. As the loss of infectivity is believed to be due to the development of immune bodies rather than to the disappearance of the virus, the blood is most infective during the earliest stages of the disease before immune bodies have been formed. These findings are important in connexion with regulations for preventing mosquitoes having access to yellow fever patients. It is very probable that most patients have ceased to be infective to mosquitoes by the time the nature of the disease is recognised and that most danger arises from persons in the incubation period.

The bodies of mosquitoes which have bitten an infective patient are infective from that time onwards, but the period which elapses before they can convey infection by their bites (the so-called "extrinsic incubation period") depends on the temperature at which they are kept. At 28° C. their bites may be infective on the ninth day. The period may be prolonged indefinitely at low temperatures; mosquitoes which after ingesting virus have been kept a long time at temperatures of between 10° C. and 15° C. have subsequently become capable of conveying the infection by their bites when the temperature was raised to 28° C. An infective mosquito usually remains infective for the whole of its life. Prof. Hindle records a fatal infection caused by the bite of one mosquito 118 days after it became infective. The use of prophylactic vaccine appears to be less hopeful than was formerly thought.

Rules for Air Routes.

Accompanying Colonel James's communication are three maps recording the names of places from



MAP OF CENTRAL AFRICA

Showing by interrupted lines the air-routes, actual or projected. The routes in use are doubled.

which cases of yellow fever have been recorded at any time during the last 20 years, but in the majority of these localities no case has been notified since 1927 in Africa and 1921 in the Americas. Upon these maps the air-routes are given as they exist or are projected in Central Africa and Central and South America. On the map of Central Africa here reproduced are indicated with a star the principal localities situated on air routes (actual or projected), and with a black dot those in which yellow fever has occurred. Colonel James concludes that the new knowledge indicates the need for more stringent prophylactic rules especially now that flight across the world is becoming common and bringing with it a new anxiety to public officials. This possibility of the introduction of disease, especially yellow fever, by passengers from air-ships was considered by the Permanent Committee of the International Office of Public Hygiene in May of last year (see THE LANCET, 1930, ii., 304), and Colonel James records with approval Prof. Ricardo Jorge's proposal for a systematic field inquiry as to whether yellow fever is still endemic in the particular areas marked on the maps. For, if so, when an aerial route passes through any of these places adequate protection to avoid risks should be taken. But, as Colonel James points out, the actions will have to be taken against a disease or an infection about which our knowledge is incomplete, although it seems to be a disease of geographical distribution.

SANITARY PRECAUTIONS.

In the same bulletin a note is published from Mr. H. Le Prince, senior sanitary engineer in the United States Public Service, dealing with the measures which can prevent the propagation of yellow fever. In the summarised conclusions he finds that the most useful measures against yellow fever are the prompt notification of suspect cases; the surveillance of cisterns, tanks, and culverts so that mosquito larvæ can be destroyed promptly; and a minute daily inspection of all the probable breeding-places, with, where the water is not drinking water, treatment with the appropriate larvicide.

MEDICINE AND THE LAW.

The New Cremation Regulations.

DISPOSAL of the bodies of the dead by means of cremation has had to contend with both prejudice and indifference. It is some evidence of progress that in 1927 regulations were at last made under the 1902 Act for the purpose of cremations in Scotland, and that in the last few months the 1920 regulations for England and Wales have been superseded by fresh directions which seem to simplify the necessary preliminaries. The new regulations, issued by the Home Office at the end of October, came into force on Dec. 9th, after having been laid before Parliament for the statutory period of 40 days. They make several changes. Provision now exists for permitting cremation where the coroner has used his power (under Section 21 of the Coroners (Amendment) Act, 1926) of directing a post-mortem examination without inquest, if he is satisfied that no inquest need be held and if he has sent the registrar his certificate of the cause of death. The procedure where an inquest has been held and the coroner gives his certificate on Form E, is now supplemented by a proviso that, if death has occurred in connexion with an industrial, railway, flying, or road accident and the coroner has adjourned the inquest with a view to investigation of the causes of the accident, he may give a certificate in a modified Form E, if satisfied that death was due to an accident, without waiting for the completion of the adjourned inquest. The coroner, therefore, now uses Form E for three contingencies—where he has directed a post-mortem

examination without inquest, where he has held his inquest and certifies the result, and where he has adjourned his inquest as already stated.

The normal preliminaries before cremation remain, the two medical certificates, one (Form B) given by the registered medical practitioner who has attended the deceased during his last illness and who can certify definitely as to the cause of death, and the other (Form C) the confirmatory medical certificate given by another practitioner. Here the Home Office has relaxed its requirements. The 1920 regulations, in this respect repeating the regulations of 1903, required that the confirmatory certificate—if not given by the Medical Referee—should be given by a practitioner of five years' standing, possessing one of the following three qualifications: (1) appointment for the purpose by the cremation authority; (2) appointment as medical officer of health, police surgeon, certifying surgeon under the Factory Act, or medical referee under the Workmen's Compensation Act; or (3) appointment as physician or surgeon in a public general hospital containing not less than 50 beds. In future no special qualification will be needed. The confirmatory medical certificate (Form C) can now be given by any registered medical practitioner of five years' standing, provided that he is not a relative of the deceased or a relative or partner of the doctor who has given the medical attendant's certificate in Form B. Among less important changes is one which apparently empowers the Home Office to appoint Medical Referees and Deputy Medical Referees under the Cremation Act on the nomination of the cremation authority instead of leaving it to the authority to appoint and notify the Home Office. As no cremation can take place except upon the written authority of the Medical Referee, whose important powers and duties are elaborated in the regulations, it is essential to fill these posts with practitioners of special experience and qualifications. Regulation 16, dealing with the disposition of ashes, provides (as before) that they shall be given to the person who applied for the cremation if he so desires; if not, in the absence of any special arrangement, the authority is to inter them decently in a burial ground or in ground reserved for the purpose at the crematorium. The authority may now scatter the ashes instead of burying them in its ground.

It is perhaps of professional interest to mention minor variations in the new forms which the medical practitioner must sign. Form B used to direct him to "specify the disease, injury, &c., and if possible distinguish the primary from the secondary cause as in the death certificate"; he was also formerly asked to say "what was its duration in years, months, or days," and whether any other cause contributed to or accelerated death. In slightly different words he is now told to state the cause of death, primary and secondary: (1) the immediate cause, morbid conditions, if any, giving rise to immediate cause (stated in order proceeding backwards from immediate cause), and (2) other morbid conditions (if important) contributing to death but not related to immediate cause. To question 18 on Form B, which asked him "have you given the certificate required for registration of death," there are now added the words, "if not, who has?" Finally, the general words at the end of the certificate have now been enlarged. The signatory, while certifying that the answers given are true and accurate to the best of his knowledge and belief, must now also certify in a new formula that "I know of no reasonable cause to suspect that the deceased died either a violent or an unnatural death or a sudden death of which the cause is unknown or died in such place or circumstances as to require an inquest in pursuance of any Act." This same formula is repeated at the end of Form C (the confirmatory medical certificate). Medical practitioners, if asked to sign Form B or Form C, should make sure that they are not using the obsolete forms of certificate prescribed by the 1920 regulations now superseded.

It is unnecessary to emphasise the duty to use scrupulous care in completing these certificates under the Cremation Act. If the public has any misgivings over the widening of the authority to sign Form C, confidence will not be established unless every practitioner performs his task with a proper sense of responsibility. Doubtless there are citizens who look suspiciously upon cremation as a possible method by which crime and foul play can be concealed. They should be reassured. The last step the poisoner or other criminal would wish to take is to submit his victim's body forthwith to the special investigations and detailed certification which the Home Office regulations prescribe.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

EDINBURGH HOSPITAL PROBLEM.

THE Edinburgh municipal policy for hospitals is now becoming more definite, and the question of the municipal hospital is being studied by the University Court. The Royal Colleges will naturally wish to be considered, and the interests of the Royal Infirmary as a voluntary hospital as well as an integral part of both university and extra-mural medical schools will need careful discussion. On the other hand, the primary problem facing the municipality is how to provide general hospital accommodation for the large mass of patients forced upon them by the transfer of poor-law hospitals, and how to meet the ever-increasing demand for hospital treatment. At the recent meeting of the Royal Infirmary it was stated that the waiting-list was the highest tribute to the efficiency of the hospital. But the waiting-list last year was 2851, and the municipality has to remember that it is the public body charged with the duty of providing for the sick. In Aberdeen, I am informed, the new professor of medicine has been made visiting physician to the new municipal hospital, and it is understood that the professors of surgery and midwifery have also been appointed. The Aberdeen problem is very largely solved, but the Edinburgh problem is much more complicated. Meanwhile, the question of paying hospitals is being steadily canvassed both in Edinburgh and elsewhere. Even in this matter the municipalities and county councils are in a strong position, for they have power to recover payment for all cases of sickness other than infectious diseases, and they can make arrangements either by themselves or in concert with the voluntary hospitals.

ALCOHOL AND THE HUMAN BODY.

In a recent lecture Prof. F. A. E. Crew said that biological experimentation had shown that alcohol could wipe out the relatively weak germ cell and embryo, thus leading ultimately to the improvement of the stock. But the experiments which had revealed these facts had shown very little, if anything, of the effects of alcohol upon the mental character, and these were much more important socially than were

the physical. Up till now most studies had approached the problems of the effect of alcohol from the angle of sociology, or of clinical medicine, but those who were interested in the future as well as in the present recognised clearly that the racial effects were no less important. It was to be hoped that in the future biologists might be encouraged to add their contributions to the construction of policies dealing with the grave subject of alcohol.

EDINBURGH ROYAL INFIRMARY.

The Edinburgh Royal Infirmary has been duly recognised and approved by the National Radium Commission as a national radium centre for Edinburgh and the south-east of Scotland. Supplies of radium are now available on loan from the Commission without the obligation to create a special institute.

Before the war the expenditure of the Infirmary was about £60,000 a year. Last year it was about £152,000. Of that amount, roughly 20 per cent. came from interest on the institution's capital, 47 per cent. from voluntary contributions, and 11 per cent. from maintenance of patients and revenue from students' fees and other sources, leaving 22 per cent. of the ordinary outlay to be met from the year's legacies. Last year the deficiency on the ordinary account amounted to £33,000. The average cost per occupied bed last year was £155 16*s*. 4*d*., an increase of £5 10*s*. 5*d*. on the preceding year.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

CHILDREN'S HOLIDAYS.

Dr. Paetsch, head of the municipal health office of Bielefeld, Westphalia, points out that in considering school holidays one must distinguish between children from big cities and those from country places. Children living in cities are exposed to the noise of streets and the unrest of tenement houses which never ceases even at night. Their leisure is often spent in badly ventilated places without a possibility of playing in the open, and unfortunately some parents take their children to restaurants and coffee-houses, where they sit in smoky rooms. Children coming from this environment must have the holidays as much as possible in fresh air with at least ten hours of sleep; after lunch every day they should have an hour or two resting. They should go to bed at 8 P.M. and ought not to be allowed to read in bed.

For younger children a stay at the seashore is ideal, but prolonged sea-bathing and a compulsory hardening must be avoided. A rapid change of habits is prejudicial. Thus it often happens that a child which at home seldom enjoys the sun is exposed entirely naked for several hours the day after his arrival. Severe burns are often the sequel. For older children games are recommended; but weakly girls and boys must not be allowed to take part in sports with the stronger children because their physical inferiority may easily lead to overstrain.

Children from the country and from smaller towns may spend their holidays otherwise, for they enjoy fresh air all the year round. Their parents ought not to employ them in agricultural work, especially in the hot season when they are often overworked. They may be sent for their holidays to the cities, where, under sensible control, they can enjoy the amenities of urban life.

TESTING OF THERMOMETERS.

By a law of 1929 every thermometer destined for medical purposes must be tested and the test must be confirmed by the stamp of the Official Physico-Technical Institute of Germany. The stamp is affixed only if the difference between the tested and the standard thermometer is not more than 0·1° Celsius at a reading of 37° and 40°. Between 41° and 42° a difference of 0·12° Celsius is allowed. The fee for the test is fixed at the equivalent of 1*d*.; if additional tests are desired by the manufacturer an additional fee must be paid.

MEDICAL WOMEN.

The number of women medical students has risen from 555 in 1911 to 3428 in the last winter term, while the number of male students has in that period increased by only 50 per cent. Seventeen per cent. of all the women university students study medicine, and the majority of girl students matriculate at Berlin and at Munich. In 1909 there were 82 qualified medical women; in 1927 the number had risen to 1739; and in 1929 to 2562, of whom 476 have settled in Berlin.

ASPHYXIA IN A LAUNDRY.

In the laundry department of a Berlin linen factory some women working with ironing machines suddenly fell ill and became unconscious; by and by 37 of them showed the same symptoms. The fire brigade and the municipal first-aid station applied oxygen so that 30 of the women could be sent home, but the remaining seven were so ill that they had to go to hospital. The factory is equipped with the most modern machinery, and the room was large and well ventilated. But the factory had been closed for four days during the Christmas holidays and the room being rather cold in consequence the exhaust ventilation plant was temporarily stopped, with the consequences described.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

CHEST SURGERY IN THE SANATORIUM.

How similar are surgical and medical problems in the most dissimilar of countries! In France, England, Norway, and doubtless in many other countries, physicians and surgeons responsible for the welfare of consumptives requiring operations on the chest have deplored the geographical fact that sanatoriums are in the country and surgical clinics in the smokiest of towns. Dr. L. Bérard and Dr. F. Dumarest have answered the question: Should the sanatorium patient go to the surgical clinic, or the surgeon establish himself in the sanatorium, in favour of the latter alternative. For three years they have practised thoracic surgery at Hauteville in sanatorium surroundings, and in a recent communication made to the Academy of Medicine they have given some impressive figures. Forty-eight thoracectomies have been done on 28 patients without a single operative fatality or death within six months of the operation. Of the five deaths occurring more than six months after operation, three could be traced to operative interventions elsewhere. Among the 28 thoracoplasties there were four which were called for on account of pulmonary perforations connected with the pleuræ. In two of these cases death followed six and ten months respectively after the operation; the other two patients could be regarded as clinically cured. In 24 other cases thoracoplasties were followed

only in three cases by death eight months and one year respectively after the operation. It was found that resection of the first six or seven ribs (thoracectomy superior) was sufficient to induce an effective collapse when the disease was limited to the upper lobe; this course did not endanger the lower lobe, the conditions established being similar to those of a selective pneumothorax. When the disease had not involved the whole of the upper lobe and was strictly apical, even this limited superior thoracectomy was considered unnecessarily radical, and an apicolysis was substituted for it. Altogether 138 phrenicectomies were performed. Some of the patients were lost sight of, and among the 118 traced six months to three years later, there were 20 deaths from pulmonary tuberculosis. In many cases early successes were followed by renewed extension of disease or by recovery of its mobility by the diaphragm. While the disease progressed in 42 cases, in spite of effective anatomical changes induced by the operation, there were 55 cases in which the clinical results were much greater than the anatomical changes seemed to warrant. No operative or post-operative accidents occurred, and the general conclusion is drawn that while the results of phrenicectomy are variable, and it may provoke extension of the disease, this operation deserves frequent employment, the more so because it may pave the way for more radical measures. Even by itself it may, almost in a trice, convert a progressive into a regressive lesion, put an end to dangerous hæmoptyses, and promote the healing of even large, ulcerating lesions. But the operation is safest when performed at a stage of comparative stabilisation of the disease.

B C G VACCINATION IN A PROVINCIAL TOWN.

At Béziers, the late Dr. Henri Roure organised in November, 1926, a system of B C G vaccination with the help of the *Bureau de Bienfaisance* and the local authorities. The machinery of this system was as follows: A nurse, employed by the bureau, went every day to the offices where births had been registered the day before. She then visited all the parents and recommended B C G vaccination which, according to the wishes of the family, was carried out by herself, the doctor in charge, or the midwife. No charge was made for this vaccination whatever the financial status of the family. Of 139 babies born in the last two months of 1926, 99, or 71·4 per cent., were vaccinated. This percentage rose to 80·1 in 1927 (741 births, 594 vaccinations), and it fell to 73·6 in 1928 (796 births, 586 vaccinations).

HISTORY OF MEDICINE.

At a meeting of the permanent committee of the International Society of the History of Medicine, held on Dec. 20th, Paraguay and Ecuador were admitted to the group, the 22 members of which include Great Britain, Germany, and Italy. With reference to the last international congress held in Rome, and Prof. Szumowski's report on the teaching of the history of medicine in the universities, it was decided to send the report to every nation with a view to such teaching becoming officially adopted. Subjects for the next congress, which will be held in Bucharest in 1933, are to be chosen from among the following suggestions: (1) the spirit of medicine in the sixteenth century; (2) the internationalisation of medicine in the nineteenth century; (3) the evolution of medicine in the Balkan countries; (4) the progress of surgery from the eighteenth to the nineteenth century; (5) medical navigators and exotic pathology.

FORTHCOMING MEDICAL EVENTS.

The following medical events are announced to take place in France during the present year:—

March 30th–April 2nd: VIIe Congrès National de la Tuberculose, Bordeaux.
March: XIIe Congrès National d'Orthodontie, Valence.
March: Réunion Hydrologique et Climatologique, Montpellier.
April 12th: XXXVe Congrès des Médecins Aliénistes et Neurologistes de France et des Pays de Langue Française, Bordeaux.
May 4th, 5th, and 6th: XVIe Congrès de Médecine Légale de Langue Française, Paris.
May 24th–25th: Congrès de Lithiase Urinaire, Vittel.
May: VIe Congrès International de Thalassothérapie, Berck-Plage (Pas-de-Calais).
July 20th–25th: LVe Congrès de l'Association pour l'Avancement des Sciences, Nancy.
July 22nd–31st: Journées Médicales Coloniales de Paris.
July 27th–31st: IIIe Congrès International de Radiologie, Paris.
August 3rd–8th: VIIIe Congrès Dentaire International, Paris.
End of September: VIIe Congrès des Pédiatres de Langue Française, Strasbourg.
Oct. 1st, 2nd, and 3rd: Congrès de l'Association des Gynécologues et Obstétriciens de Langue Française, Bordeaux.
Oct. 5th: XIe Congrès de l'Association Française de Chirurgie, Paris.
Oct. 6th: XXXIe Congrès Français d'Urologie, Paris.
Oct. 9th: IIe Réunion Annuelle de la Société Française d'Orthopédie, Paris.
Oct. 14th–18th: IIe Congrès International de Pathologie Comparée, Paris.
Oct. 19th: Congrès Français d'Oto-Rhino-Laryngologie, Paris.
October: XXIIIe Congrès d'Hygiène, Paris.
October: XIIe Congrès des Médecins et des Chirurgiens des Hopitaux, Paris.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 24TH, 1931.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 272 (last week 187), scarlet fever, 1793; diphtheria, 1543; enteric fever, 37; pneumonia, 2058; puerperal ever, 63; puerperal pyrexia, 125; cerebro-spinal ever, 20; acute poliomyelitis, 4; acute polioencephalitis, 2; encephalitis lethargica, 16; dysentery, 7; ophthalmia neonatorum, 86. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 27th–28th was as follows: Small-pox, 255 under treatment, 1 under observation (last week 225 and 8 respectively); scarlet fever, 1561; diphtheria, 1950; enteric fever, 11; measles, 101; whooping-cough, 197; puerperal fever, 33 (plus 14 babies); encephalitis lethargica, 121; poliomyelitis, 2; "other diseases," 106. At St. Margaret's Hospital there were 13 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (2) from enteric fever, 73 (0) from measles, 8 (1) from scarlet fever, 30 (4) from whooping-cough, 53 (10) from diphtheria, 58 (13) from diarrhœa and enteritis under two years, and 242 (47) from influenza. The figures in parentheses are those for London itself.

The fatal case of enteric fever outside London occurred at Tynemouth. Thirty fatal cases of measles were reported from Liverpool, 9 from Bristol, 7 from Hull, and 5 from Tynemouth. Liverpool reported 4 deaths from whooping-cough; East Ham, Birmingham, Manchester, and Middlesbrough each 2. Diphtheria claimed 10 victims at Liverpool, 4 at Leeds. Diarrhœa was credited with 9 deaths at Liverpool, 4 each at Birmingham, Manchester, and Leeds. The 195 fatal cases of influenza outside London are scattered over 64 great towns; 68 deaths were reported from Liverpool, 6 each from Birmingham, Bolton, and Manchester, 5 each from Croydon and Sunderland. No deaths from small-pox were reported for the month of December last outside the great towns.

The number of stillbirths notified during the week was 270 (corresp nding to a rate of 40 per 1000 births), including 39 in London.

THE SERVICES

HEALTH OF THE NAVY IN 1929.

THE statistical report of the health of the navy for the year 1929 has just been issued,[1] eight months after its predecessor—a notable achievement. Its price has been reduced by a half.

The total force was 86,240 (90,820 in the previous year); the fresh cases were, per 1000, 482·03 (445·99); the invalids, 14·30 (11·41); and the deaths, 2·94 (2·22); all showing increases for this year. The chief cause of loss of service was local injury and wounding, then acute gonorrhœa, followed by catarrh. The chief causes of invaliding were tuberculosis, pulmonary, 228 (119); diseases of the eye, 170 (214); diseases of the ear, 132 (111); and injuries, 105 (69). Deaths were 254 (202), the chief causes being pneumonia, 21 (15); tuberculosis, pulmonary, 19 (17); diseases of the intestines, 15 (15); meningococcal infection, 12 (2); "other respiratory diseases," 10 (6); and from all injuries, 92 (67), of which 43 from drowning. There were 9 (14) suicides. Successful vaccinations increased by some 3000. Enteric group, 5 (7) cases; influenza, increased as in the army, 1661 (468), and chiefly on the home station and in the Atlantic Fleet, also on the Mediterranean station. Malarial cases were increased, especially in the eastern Mediterranean, Basidu, Bombay, and Lagos; Mediterranean fever, 14 cases, 7 arising at Malta; meningococcal infection, 43 (1), 37 of the cases were on the home station, 26 from the general depôt at Chatham; of these two, arising when the patients were on leave, proved fatal; in one case the patient's throat swab prior to proceeding on leave was negative. One case from a ship in the Mediterranean was fatal. The largest number of cases of pneumonia (26) came from the Chatham depôt, which also gave most cases of rheumatic fever. Two cases of small-pox occurred at Shanghai, though the patients had been vaccinated within five years. There was a considerable increase in pulmonary tuberculosis this year, 240 (153), but a decrease in tuberculosis, non-pulmonary, 20 (29); the ratio in most of the larger groups is increased, and the liability seems, as in the army, to increase with age and service. Venereal disease cases are increased, 73·74 (67·96), but the number daily under treatment is reduced.

It is claimed that there has been a slight improvement in the dental condition of the personnel, but 73 per cent. of men on draft to seagoing ships were unfit, as against 71 in 1928. Scabies cases were 11·44 (13·82), an improvement, but they took longer (7·32 days each) to cure. It is disappointing to see that, in addition to a ratio of 206·78 per 1000 from infectious disease, there was a ratio of 810·86 from disease of the respiratory system in the *St. Vincent* training ship, though it is pleasant to note that no cases of pulmonary tuberculosis appeared in the training service this year. There is still no report on the cadets at Dartmouth.

This report, prepared as it has been in eight months, is making up leeway. Next year, when there is more time, we may hope that more interest may be allowed to creep into the station reports and the summary of the Director-General. It may not occur to the Admiralty, but the medical reports of the navy have been, at times, of considerable professional interest. Thus there was in 1870 an epidemic of cholera at Zanzibar, and when it is asked whence that came it will be answered that the earliest mention of this particular epidemic was made by the medical officer of H.M.S. *Penguin*, which ship, cruising in the Gulf of Aden in the early part of 1865, took two dhows with slaves, amongst whom were several with cholera. They were the only infected dhows then reported, and that cholera epidemic travelled to Mecca and was carried to Africa, passed through Abyssinia, Somaliland, &c., in four years, through countries that now aeroplanes cross in three days, to reach Zanzibar, and the time could not have been fixed or the origin have been determined but for the report from the assistant surgeon of the *Penguin*, published in the statistical report for 1865.

[1] H.M. Stationery Office. Pp. 153. 2*s.* 6*d.*

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. H. C. Devas is placed on the retd. list at his own request with rank of Surg.-Capt.

Surg. Lt. R. B. McVicker to be Surg. Lt.-Comdr.

S. K. Foster, A. H. O'Malley, and J. M. T. Reese to be Surg. Lts.

The following appts. have been made:—Surg.-Comdr. J. Wylie to *Ganges*, for R.N. Sick Quarters; L. W. Gemmell to *Cornwall*; and P. N. Button to *Vindictive*. Surg. Lt.-Comdr. M. Barton to *Pembroke*, for R.M. Infirmary, Deal. Surg. Lts. H. D. Plunkett to *Resolution*, and W. Holgate (D.) to *Cornwall*.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Sub-Lts. A. C. Howard and M. G. Stratford to *Victory*, for R.N. Hospital, Haslar.

ROYAL ARMY MEDICAL CORPS.

Col. B. B. Burke, late R.A.M.C., retires on retd. pay on account of ill-health.

Lt.-Col. (temp. Col.) O. Ievers, from R.A.M.C., to be Col., vice Col. Burke.

Lt.-Col. H. H. J. Fawcett to be temp. Col.

Maj. and Bt. Lt.-Col. (temp. Lt.-Col.) A. D. Fraser to be Lt.-Col., vice Lt.-Col. (temp. Col.) Ievers.

Maj. J. E. M. Boyd to be temp. Lt.-Col.

Maj. W. T. Graham retires on retd. pay.

Maj. P. Hayes is placed on retd. pay.

The undermentioned Lts. to be Capts.: Lt. D. B. O'Sullivan-Beare, L. R. S. MacFarlane, M. F. N. Griffin, H. A. Ferguson, de L. Carey, and M. G. de L'I. Sturm.

D. P. F. Mulvany is granted a temp. commn. in the rank of Lt.

ARMY DENTAL CORPS.

Capt. J. L. Craig is placed on the half-pay list, on account of ill-health.

Lt. F. J. McCarthy, temp. Dental Surg., Gen. List, to be Lt. (on prob.).

TERRITORIAL ARMY.

J. M. Lees (late Cadet, Rugby Sch. Contgt., Jun. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE.

Dental Branch.—The undermentioned Squadron Leaders, R.A.F., Majors, Army Dental Corps, relinquish their temporary commissions on return to Army duty: A. K. Macdonald and H. O. Sumerling.

INDIAN MEDICAL SERVICE.

Col. W. V. Coppinger to be Maj.-Gen.

COLONIAL APPOINTMENTS.

Lt.-Col. P. Hope-Falkner, R.A.M.C., M.O.H., St. Kitts-Nevis; Dr. J. P. O'Mahony, Supernumerary Medical Officer, Leeward Islands; Dr. W. A. Burnett, Medical Officer, W. African Medical Staff, Nigeria; Dr. R. J. Krogh and Dr. E. Siung, Government Medical Officers, Trinidad; Dr. A. W. Williams, Medical Officer, Uganda; Dr. F. E. Camps, Dr. J. A. K. Fitzgerald, Dr. E. R. Gould, and Dr. K. T. Moir Medical Officers, W. African Medical Staff; Dr. H. S. de Boer to be Deputy Director of Sanitary Services, Northern Rhodesia, and Dr. C. F. Lassalle to be Deputy Surgeon-General and Medical Inspector of Health, Trinidad.

A LINCOLNSHIRE SMALL-POX HOSPITAL.—Application is being made to the Ministry of Health for a provisional order for the formation of a joint board representative of the whole of Lindsey, with the boroughs of Lincoln and Grimsby, for the administration of a small-pox hospital on Osgodby Moor. The hospital, which was built by the Caistor rural council, stands on lonely moorland surrounded by trees. It will have to be enlarged and the water-supply improved.

CORRESPONDENCE

THE STRUCTURE OF NEUROSIS.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 24th (p. 217) Dr. Parkes Weber raises the question of the factors which underlie the behaviour-changes which are found to follow an attack of epidemic encephalitis. The precise meaning of the question, as stated, is not altogether clear, but I take it that by the parenthetic qualification, "indirectly," Dr. Parkes Weber means that the post-encephalitic recognises in himself the existence of a physical damage, and unconsciously reacts to this recognition by setting up a defence-mechanism against it and against the sense of inferiority which arises therefrom. I believe, however, that experience shows that, speaking generally, those cases which exhibit the most marked behaviour-changes show the least marked physical sequelæ, and *vice versa*.

I venture to suggest that a more plausible explanation is that the changed behaviour is the evidence of a regression to a more infantile type of behaviour-response to stimuli—in other words, there is a reduction of the epicritic (or, as Sir Herbert Parsons terms it, the syncritic) control to a protopathic level with its "all or none" type of reaction. The patient regresses to that early period in the development of his personality, when he is, to use Prof. Lloyd Morgan's phrase, a "self of enjoyment" in which there is no distinction between *meum* and *tuum*, before the capacity for self-criticism has emerged, and while the reaction to emotional stress is still uncontrolled. The frequency with which such a patient develops habits of thieving, lying, and fantasy-building seems to support this view.

In his book, "The Measurement of Emotion," Mr. Whateley Smith shows that alcohol acts in the same way by suppressing the syncritic and epicritic control, thus reducing the participant to a protopathic level until in extreme cases even this level is passed and unconsciousness results. It may perhaps be added that since the severe epidemic in 1894 very few of the recognised cases of encephalitis have shown those characteristic behaviour-changes which previously had been reported from many parts of the world.

I am, Sir, yours faithfully,

Birmingham, Jan. 31st, 1931. G. A. AUDEN.

DIET IN DIABETES.

To the Editor of THE LANCET.

SIR,—Your annotation of Jan. 17th (p. 142) summarises the accumulating experience in the dieting of diabetics. For several years Dr. A. P. Thomson has been applying the principle of the relatively high carbohydrate content diet. The value has been demonstrated in many of the 700 out-patients in his diabetes clinic at the General Hospital, Birmingham. Patients attend at suitable long or short intervals and on each attendance a blood-sugar estimation is made; Rothera's test for ketosis also is frequently carried out. Such tests together with the clinical appraisement at regular intervals allow a fairly trustworthy impression of the value of the principle to be made.

A table of "rations," which are 10 g. carbohydrate equivalents of foods, having a high carbohydrate content—e.g., bread ½ oz.—forms the basis of most of our dieting instructions. The two diets chiefly used are: (1) restricted protein (P) and fat (F); and (2) unrestricted P and F, each plus a given number of rations of carbohydrate (C), which are never less than 7, frequently 8 to 12, and may be as high as 16 or 18. Dieting instructions are therefore reduced to the simplest. In many severe cases the restricted P and F diet plus 7 to 10 rations is ordered; in a few of the severe, most moderate and all mild cases no restrictions as to P and F are made, and the patient is instructed as to how many rations of C he may take, and these he chooses according to his fancy from the table. It will thus be seen that, whether restricting P and F or not, our practice is to allow a diet which has a high C content, but which is not so high as that containing 250 g. mentioned in your annotation. In short, we have found that the best clinical results, together with the most pleasing régime for the patient, is one in which the P and F are either considerable or unrestricted, and the C allowance is generous; in fact, it represents the mean between the two extremes which you mention. In order to avoid ketosis at least 70, and sometimes more, grammes C are necessary.

In a recent examination of 125 of our records the effect of the unrestricted P and F diet, in those cases in which it had been ordered, on the blood-sugar level was noted, and it was found that it was giving satisfactory results (as judged by this relatively rigid standard) in the mild and moderate cases, and in some of the severe cases also. Further, some time ago we undertook a more elaborate investigation by noting the blood-sugar curve plotted four times during the day before and after patients were changed from restricted to unrestricted P and F; the rations of C and the insulin dose, if any, were kept constant. Judged entirely by the rigid standard of blood-sugar level alone, the majority showed no deterioration on the unrestricted P and F diet, and even the minority, showing a generally raised blood-sugar level, were clinically well and progressing satisfactorily.

The records of a large number of blood-sugars have shown that there are very considerable variations in the amount of glucose metabolised by an extra unit of insulin—varying with the head of sugar in the blood, the size of the original dose of insulin (which is related to the insulin capacity of the individual), and perhaps an individual unknown factor. Thousands of blood-sugar estimations have emphasised the well-known fact that the blood-sugar may vary widely in the same person, unaccompanied by any clinical change, alteration in diet, or insulin dose. This fact has to be borne in mind in assessing the results of changes in diet and treatment.

Our experience is generally in accord with your statement that, since the introduction of insulin, patients look and feel well, no matter what they are eating—providing that some balance between insulin dose and carbohydrate intake is retained and ketosis is guarded against. Frequently they report they feel better on the higher diet, even though the blood-sugar level may be raised by 0·1 per cent. It is a fairly common experience to find that a patient will feel better on a diet giving a blood-sugar of 0·2 to 0·25 per cent. instead of a lower one keeping the blood-sugar down to 0·1 or 0·15 per cent.

Dr. Joslin in his diabetic manual is recommending 100 to 150 g. C daily and remarks that this often calls for a higher insulin dose. We would add that, providing 80 or more grammes C can be metabolised

satisfactorily on a given insulin dose (if any), often an increase of P and F may be allowed without any raising of the blood-sugar or call for more insulin. The explanation of this is obscure.

I am, Sir, yours faithfully,

ROBERT GITTINS,
Diabetes Research Student, The General Hospital, Birmingham.

Jan. 31st, 1931.

THE QUALITY OF PANEL SERVICE.

To the Editor of THE LANCET.

SIR,—In your last issue, under the heading Panel and Contract Practice (p. 274), Dr. Hodder is reported as saying that "the medical practitioner in the treatment of his insured patients is not restricted in any way as to the drugs he should employ in his prescriptions." What a delightful sop to the insured patient this is! Personally I am definitely restricted in my prescribing. Since starting practice here about two years ago I have twice had letters to answer referring to over-prescribing, and twice had to attend interviews at my surgery to "explain" my over-prescribing. As I naturally am not going to run any risk of being fined, in the majority of prescriptions now I use the simplest of the National Formulary examples—mist. alba, mist. expect., &c. Thus I am definitely restricted (1) by fear of loss of time, (2) by fear of further worry, (3) by fear of monetary loss in fines, and, however slight these fears should be, they do undoubtedly restrict one's prescribing.

I am, Sir, yours faithfully,

C. C. FENWICK, M.B., B.S.

Rochdale, Jan. 31st, 1931.

MASTOIDITIS IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—I am indebted to Dr. E. Ashwood Underwood for drawing attention (THE LANCET, Jan. 31st, p. 240) to the fact that I have omitted in my work on "Acute Infectious Diseases" to mention the occurrence of mastoiditis as a complication of diphtheria, an omission which I propose to repair in a subsequent edition. I have, however, on p. 16 of my second edition, emphasised the frequency of mastoiditis as a complication of primary diphtheria of the middle ear, and referred to a paper by Lambert,[1] who in a series of 11 cases of primary diphtheritic otitis had four complicated by mastoiditis. Although much less common than in scarlet fever, otitis media in my experience is not so rare a complication of faucial diphtheria as Dr. Underwood maintains. In the course of last year, out of 1428 completed cases at the Western Hospital, 23, or 1·6 per cent., developed otitis, but only one of these, a girl aged 9, showed any signs of mastoid involvement. Wilde's incision was employed, and recovery took place without further intervention. A still greater frequency of otitis as a complication of diphtheria will be found in the Metropolitan Asylums Board's reports, especially in that of 1910, which shows that the incidence of this complication during the preceding ten years ranged in the various hospitals of the Board from 4·01 to 7·4 per cent., the average being 5·6 per cent. No statistics, however, are shown in these reports of the incidence of mastoiditis in diphtheria, probably owing to its extreme rarity.

I am, Sir, yours faithfully,

J. D. ROLLESTON.

Western Hospital, S.W., Jan. 31st, 1931.

[1] Arch. méd. belges, 1920, lxxii., 382.

HOMINAL EXPERIMENT.

To the Editor of THE LANCET.

SIR,—I should like to inquire where I may find a printed, typed, or mimeographed outline of a course in medical school physiology which meets or is the closest approach to that which Lord Moynihan holds as an ideal (THE LANCET, 1930, ii., 779, et seq.).

I feel that it would be an advance to have students do considerable experimentation upon themselves as well as using clinical material for laboratory work in physiology. It would be merely a time-consuming task for me to sketch up such an outline but it would be very obvious, to begin with, that it would lack the sense of proportion and maturity which would come only with use and continual revision.

We teach physiology in the University of Georgia from a list of printed directions, with simple apparatus and upon animals as well as upon the student himself. I would welcome more experiments upon the students themselves and upon clinical material. In making this move I feel that we must adhere to simple experiments, as free as possible from those elements which divert the attention of the student, and to experiments which yield uniform results.

I am, Sir, yours faithfully,

E. W. SCHWARTZE,
Professor of Physiology, University of Georgia.

Jan. 15th, 1931.

SEX DETERMINATION.

To the Editor of THE LANCET.

SIR,—I have lately come across three cases of childbirth in which the date of conception was known. In one case it was 11 days after the beginning of a period, in another 12, and in the third 13. All three children were boys and all three mothers had previously had girls only. Mrs. Erskine, in her book "Sex at Choice," says that children conceived before the tenth day after the beginning of a period may be of either sex, while those conceived between the tenth and the sixteenth day will be boys and those during the last week before a period, girls. I know that on cattle farms the sex of the calf can, in most cases, be regulated by the time during the œstral cycle at which the bull is put to the cow. Huxley has recently shown that the sex of a child depends on the number of chromosomes in the fertilising spermatozoön, so, if what applies to cattle applies also to human beings, it seems possible that the affinity of the ovum for the "male" or "female" spermatozoön varies at different times of the menstrual cycle. As this is a subject which has interested mankind almost since mankind began, and as one can argue nothing from three cases I hope that others may give their views and experiences.

I am, Sir, yours faithfully,

H. WILLIAMSON, M.D., F.R.C.S. Edin.,
Major, I.M.S.

Baluchistan, India, Jan. 4th, 1931.

PUERPERAL SEPSIS.

To the Editor of THE LANCET.

SIR,—Perhaps the problem of puerperal sepsis will be met (as far as cases arising in hospital are concerned and not infected before admission) by having maternity hospitals built outside the great cities. These lying-in hospitals of the future will probably have semi-open-air wards and theatres, of sanatorium type. Under such conditions the standard of health

of the patients, nursing, and medical staff can be maintained at a high level, and it may well be that the presence or absence of streptococci in the nasal flora would become a matter of small importance. After all, an almost imperceptible change in food and habits has caused the disappearance of chlorosis in modern life, and under suitable conditions the same fate should attend puerperal sepsis.

I am, Sir, yours faithfully,

J. C. G. DICKINSON.

Braunton, N. Devon, Jan. 31st, 1931.

ACUTE TOXIC HEPATITIS AFTER ACRIFLAVINE.

To the Editor of THE LANCET.

SIR,—I have regularly used acriflavine since first learning of its antiseptic properties from Dr. Browning of the Middlesex Hospital many years ago, and I am pleased to be able to endorse Dr. Hanschell's letter in your last issue. I have employed it orally by means of enteric coated tablets, intravenously in septicæmia by means of a solution of neutral tablets for this specific purpose, and locally, in the treatment of wounds, by solution and emulsion. It is still, I understand, used at Middlesex Hospital, and the extensive experience quoted by Dr. Hanschell confirms my opinion that it can safely be used with ordinary care without fear of untoward effects. It seems extraordinary that so many years have elapsed before deleterious symptoms have been reported. It would be interesting to know from which firm the drug was supplied in the cases quoted by Dr. Cullinan. Personally I only use preparations from one firm who specialise in its manufacture. I have come to regard acriflavine as one of the safest and as near the ideal antiseptic as at present obtainable.

I am, Sir, yours faithfully,

T. YOUNG SIMPSON.

Harley-street, W., Feb. 3rd, 1931.

MEDICAL NEWS

University of Cambridge.

E. G. Fearnsides Scholarship.—This scholarship; which is for clinical research on the organic diseases of the nervous system, is open to members of the university or of Girton College or Newnham College who are graduates or titular graduates in Medicine, or to graduates or titular graduates in Arts who have passed Part II. of the Natural Sciences Tripos. Applications must be sent to the Registrary before June 20th.

University of London.

Among new Fellows of King's College are Sir George Newman, chief medical officer of the Board of Education and the Ministry of Health, and Mr. Arthur Edmunds, senior surgeon to King's College Hospital.

The Julius Mickle Fellowship for 1931 has been awarded to Dr. C. H. Andrewes for research on viruses.

Royal College of Physicians of London.

At a meeting of the College on Jan. 29th, with Sir John Rose Bradford, the President, in the chair, the following candidates were admitted to the Membership :—

Gilbert Cleary Babington, M.D. Lond., Kenneth Vernon Bailey, M.D. Manch., William George Barnard, L.R.C.P., Andrew Russell Buchanan, M.D. Melb., George Douglas Gordon Campbell, M.B. Toronto, Frederick Russell Chisholm, M.D. Melb., George Alexander Davidson, M.D. Manitoba, Derek Ernest Denny-Brown, M.B. New Zeal., Carl Hercules Fouché, M.B. Edin., John Lewis Franklin, M.B. Camb., Mohammad Mohammad Gaafar, M.B. Cairo, Alexander Stephenson Hall, L.R.C.P., Percy Ellis Thompson Hancock, L.R.C.P., Sydney Walpole Hardwick, L.R.C.P., John Clifford Hoyle, M.B. Lond., Stanley George James, M.B. Sydney, Florence Heath Johnson, M.B. Oxf., Austin Braybrooke Kettle, M.B. Lond., Norman Murdoch Matheson, M.B. New Zeal., Louis Mirvish, M.B. Cape Town, William Eric Marcus Mitchell, M.B. Lond., Geoffrey Charles Pether, M.B. Lond., Datla Satyanarayana Raju, M.B. Madras, George Harold Robertson, M.D. New Zeal., Stephen John Scurlock, M.D. Lond., Gwladys Victoria Smallpeice, M.D. Lond., Laurence Alfred Howard Snowball, M.B. Lond., Edward Samuel Stern, L.R.C.P., Samuel Sappy Suzman, L.R.C.P., Percy Stanley Tomlinson, L.R.C.P., and Ernest Rohan Williams, M.B. Lond.

Licences to practise were conferred upon 127 candidates (110 men and 17 women) who have passed the Final Examination of the Conjoint Board. The following are the names and medical schools of the successful candidates :—

J. E. Abell, Leeds; I. S. Acres, London; F. P. Adams, St. Bart.'s; S. S. Ahluwalia, M.B., Punjab and Univ. Coll.; N. W. Alexander, Cambridge and St. Thomas's; S. Amir-ud-Din, M.B., Punjab; A. T. Andreasen, St. Bart.'s; Gwendolen E. Austin, King's Coll.; H. B. Barker, St. Mary's; C. C. Beresford, London; C. E. Bevan, Cambridge and St. George's; B. N. Bhandari, Punjab and Durham; K. Biden-Steele and E. T. Blacklee, Guy's; J. F. E. Bloss, St. Thomas's; L. T. Bond, Cambridge and St. Thomas's; J. D. Bright-Richards, Liverpool; K. C. Buck, St. Mary's; J. T. Cahill, Galway and London; H. Canwarden, St. Mary's; A. B. Carter, Cambridge and St. Thomas's; W. N. Chalmers, Liverpool; M. H. Churchill, St. Bart.'s; A. R. Clarke, Guy's; G. M. Conder, Middlesex; J. S. Cotman, St. Mary's; J. L. S. Coulter, Bristol; S. T. Cowan, Manchester; H. E. B. Curjel, St. Thomas's; A. Cursham, Cambridge and St. Thomas's; R. D. Darley, Univ. Coll.; Jane A. Davies, Cardiff and Royal Free; R. R. Davies, Univ. Coll.; F. M. Day, St. Mary's; C. G. Eastwood, M.B., Manchester; J. M. Erskine-Young, M.B., Liverpool; C. F. Evans, Melbourne and London; Mary Evans, King's Coll.; B. E. Fernando, L.M.S., Ceylon and Middlesex; E. D. FitzPatrick, Birmingham; J. S. B. Forde, Manchester; R. J. Furlong, St. Thomas's; J. R. Gilmour, London; R. W. Graham-Campbell, Cambridge and St. Bart.'s; E. B. Grogono, London; Rachel Gubbay, M.B., Punjab and Royal Free; N. Harburn, Manchester; H. E. Harding, London; Florence R. Hart, King's Coll.; Joan E. Harwood, Charing Cross; F. T. J. Hobday, Cambridge and St. Bart.'s; G. N. Humphreys, Cambridge and St. Mary's; J. T. Irving, Cambridge and Guy's; D. W. James, Guy's; N. R. Jeffery, Manchester; V. S. John, M.B., Rangoon and Guy's; E. Johnson, Manchester and Univ Coll.; E. Jones, St. Thomas's; L. R. Jordan, Bristol; Henrica A. Kellgren, Univ. Coll; J. A. Kersley, Bristol; T. C. Lansdale and S. Lefcovitch, Guy's; C. S. Lewis, Cambridge and London; A. H. Loudoun, St. Thomas's; Marjorie Low, Royal Free; G. G. Ludgater, Cambridge and London; Marjorie N. Lunn, Royal Free; J. O. McCarter, Manchester; S. F. Marshall, St. Bart.'s; R. W. Maxwell, Univ. Coll.; W. A. Mirza, M.B., Lucknow and London; E. D. Morgan, Manchester; J. E. L. Morris, Liverpool; Lois M. Munro, Royal Free; Emilata Nawalkishore, M.B., Bombay and Royal Free; Ethelwyn M. Newham, Royal Free; D. Ockman, Manchester; M. J. O'Donnell and J. W. Oliver, Guy's; Doris Onions, Leeds; J. A. R. O'Regan, M.B., Otago; F. L. L. Patrick, St. Bart.'s; H. C. Pickering, London; J. H. Pierre, St. Bart.'s; Winifred M. Pitkin, Oxford and Charing Cross; W. H. Poole, Cambridge and London; S. Rajapaksa, King's Coll.; T. P. V. Rao, Burma and St. Thomas's; G. J. Roberts, M.B., Cardiff and Edinburgh; H. W. Rodgers, St. Bart.'s; L. Rose, St. George's; P. M. G. Russell, Univ. Coll.; J. D. Scott, St. Bart.'s; T. D. Shahani, M.B., Bombay and Charing Cross; E. M. Sharples, St. Bart.'s; I. Sherman, Cape and St. Bart.'s; C. H. Sherwood, Birmingham; R. H. D. Short, Univ. Coll.; M. I. Silverton, Leeds; R. N. C. Smith, Guy's; L. R. C. South, Cardiff and London; S. K. Squires, St. Mary's; A. M. Stewart-Wallace, Univ. Coll.; N. V. Storr, St. Thomas's; Mary Sutcliffe, Cambridge and Leeds; R. B. Sutcliffe, Guy's; T. R. Swarup, M.B., Lucknow and King's Coll; W. A. F. Taylor, Bristol; W. S. Terry, Birmingham; O. Thomas, London; W. E. Thomas, Cardiff; W. J. Tindall, Univ. Coll.; T. F. Todd, Guy's; V. H. Tompkins, Cambridge and Leeds; R. L. H. Townsend, Oxford and London; D. Trimble, Birmingham; R. S. Trueman, St. Bart.'s; N. A. Vernon, St. Thomas's; F. L. Wheaton, Middlesex; A. G. W. Whitfield, Birmingham; R. C. W. Whitling, Oxford and London; R. Wilkinson, Birmingham; Anne E. Williams-James, Cardiff and Bristol; D. Wilson, St. Mary's; Edna M. Wilson, Charing Cross; and T. D. G. Wilson, Cambridge and Univ. Coll.

A supplementary list of licentiates will be issued after the termination of the examination on Feb. 4th.

The undermentioned diplomas were conferred (jointly with the Royal College of Surgeons) upon the following candidates :—

Diploma in Public Health.—S. D. Ahuja, Mary E. Appleby, R. Behari, F. W. Bradley, E. L. Carter, Elizabeth Cooper, W. L. S. Cox, J. Fenton, A. Golombek, F. Grundy, M. L. Gulatee, W. Gunn, Josephine M. Howells, L. R. Kapur, Margaret S. Mackay, L. M. J. A. Pilot, S. T. Seccombe, W. E. Tyndall, and K. K. Wood.

Diploma in Psychological Medicine.—W. R. Ashby, E. P. Boyle, T. P. Curran, B. Das, J. B. Dedman, G. H. Fraser, B. K. Lal, W. Lambert, S. J. Laverty, T. W. Robbins, T. G. Short, and May I. Wallace.

Diploma in Laryngology and Otology.—A. L. Bryant, E. J. G. Glass, A. S. Hatch, H. B. Lieberman, M. L. Poston, D. I. Rees,

W. J. Roche, G. C. Snell, Nettie H. Stein, J. D. Wicht, and R. N. Wilcox.

The College passed a resolution expressing strong disapproval of the proposal contained in the Representation of the People Bill to abolish university franchise and university representation.

Dr. J. A. Arkwright was elected an Examiner in Tropical Medicine and Hygiene, and the President announced that the Censors' Board had appointed Dr. James S. Collier to deliver the FitzPatrick Lectures in November.

The following Fellows were appointed representatives of the College: Sir John Rose Bradford, at the centenary celebrations of the British Association for the Advancement of Science in September next; Dr. Henry Hallett Dale, at the Faraday celebrations at the Royal Institution of Great Britain in September; Dr. F. G. Chandler, at the seventh annual conference of the National Association for the Prevention of Tuberculosis at Margate in June; Dr. S. Monckton Copeman, at the congress of the Royal Sanitary Institute at Glasgow in July; and Dr. J. L. Birley, at the second biennial conference of the National Council for Mental Hygiene, London, in May.

Surgeon-Capt. S. F. Dudley will deliver the Milroy lectures (Feb. 26th and March 3rd and 5th) on Some Lessons of the Distribution of Infectious Disease in the Royal Navy; Dr. Macdonald Critchley the Goulstonian lectures (March 10th, 12th, and 17th), on The Neurology of Old Age; and Sir William Willcox, the Lumleian lectures (March 19th, 24th, and 26th), on Toxic Jaundice. All these lectures will be given at the College at 5 P.M.

Scottish Conjoint Examining Board.

The examinations of the Board of the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh, and the Royal Faculty of Physicians and Surgeons of Glasgow, have just concluded at Edinburgh. Of 81 entered, the following 18 candidates passed the final examination and were granted the licentiates' diploma.

J. L. Razdan, Barnet Meyerowitz, Fouad Nafi, M. J. Liebenberg, John Cochran, H. W. C. Robertson, E. E. Smithers, A. R. Rasaiah, A. E. Carrol, T. W. Gregory, Wai-Ming Tso, J. C. Blok, C. L. Tessensohn, Nathan Shapiro, Richard Morton, J. D. Blaine, A. A. MacDougall, and Harry Michaelson.

London Jewish Hospital Medical Society.

On Thursday, Feb. 12th, at 3.30 P.M., Dr. Somerville Hastings, M.P., will address this Society on the Trend of Medical Practice. Visitors are invited.

Medical Officers of Schools Association.

The annual general meeting of this association will be held at 11, Chandos-street, London, W., on Friday, Feb. 20th, at 5 P.M. (tea 4.30). Dr. W. J. O'Donovan will read a paper on Impetigo in Day and Public Schools.

Royal Microscopical Society.

At the annual general meeting of this Society in London on Jan. 21st Prof. R. Ruggles-Gates was re-elected president and Dr. W. E. Cooke a vice-president. Among the members of council are Dr. E. W. Bowell, Dr. G. M. Findlay, Prof. R. T. Hewlett, and Dr. J. E. McCartney.

Congress of Thalassotherapy.

The sixth International Congress of Thalassotherapy will be held from May 25th to May 30th at Berck-sur-Mer. There will be opportunities for visiting certain of the battle-fields and of inspecting weaving and lace manufactories as well as Paris-Plage and Le Touquet. Full information can be obtained from Dr. Mozer, General Secretary, Hôpital Maritime de Berck-Plage, Pas-de-Calais, or from Dr. Pierret, 95, Avenue Kléber, Paris 16.

Summer Cruise to Norway.

Our contemporary the *Bruxelles-Médical* has chartered a steamer, the *Foucauld* (15,000 tons) and organised a cruise during July to the coast of Norway with various extensions of an interesting route. The departure will take place from Dunkirk on July 11th, calling at Zeebrugge on July 12th; afterwards the route going north along the coast of Norway will allow of visits to various beautiful fjords until Spitzbergen is reached. The return journey south, along the pack-ice, will include stops at Jan Mayen, the Faroe Islands, the Hebrides, and Leith. Here the British tourists can disembark, but the actual voyage is timed to end on August 6th by return to Dunkirk. The reduced return fare for doctors and their wives and children accompanying them is £36 10*s.* per head first-class, but only £16 second-class. The inclusive expense of the excursions is calculated at £7 5*s.* For dates, full particulars, and prices of accommodation application should be made to the Section des Voyages de Bruxelles-Médical, 29, Boulevard Adolphe Max, Brussels. The rebates to members of the medical profession are considerable.

AT their quarterly meeting on Jan. 28th the directors of the Naval Medical Compassionate Fund distributed £90 among applicants.

Dr. Kenrick Stanton Wise (Surgeon-General) has been appointed a member of the Executive Council of the Colony of Trinidad and Tobago.

ON the occasion of the tenth anniversary of the Polish Society of Oto-Laryngology Sir StClair Thomson was elected an Honorary Member.

Hospital Sunday.

The London Hospital Sunday this year has been fixed for June 21st.

Coventry Hospital Saturday Fund.

Last year this fund collected £23,500, which includes £3000, the proceeds of the annual carnival. The money was last week handed to the Coventry and Warwickshire Hospital. Since the fund was begun in 1873 it has raised over £328,000.

Keswick Cottage Hospital.

Last year 329 in-patients were treated at the Mary Hewetson Cottage Hospital, Keswick, an increase of 42, the largest number hitherto. The average duration of their stay was 22·75 days, and the average cost per bed £2 13*s.* 9*d.*, an increase of 8*s.* 9*d.* per bed per week over the previous year. A new operating theatre is being built and equipped at the cost of Sir John and Lady Randles.

Booking Seats for Out-patients.

On Jan. 27th the Victoria Memorial Jewish Hospital, Manchester, inaugurated a scheme designed to obviate the long waits of out-patients and based upon the theatre booking-office system. An office with a telephone and a plan of the hall with numbered seats has been installed, and each out-patient will be allotted a time at which he may attend and receive treatment without delay. As the patient leaves after treatment, or afterwards by telephone, he will book an appointment and receive a ticket coloured according to the doctor who is attending him. Doctors will also be able to book seats for out-patients by telephone. The out-patient attendances at this hospital last year exceeded 58,000, but since Jan. 1st there has been a very large increase, chiefly of non-Jews. The hospital is to be enlarged at a cost of £40,000.

Dinner to Sir Marriott Cooke.

On Jan. 26th Sir Marriott Cooke, M.B., whose office as Commissioner of the Board of Control ended on the coming into operation of the new Mental Treatment Act, was entertained at dinner at the Café Royal, London, by his late colleagues. Joining the Lunacy Commission in 1898, Sir Marriott became in 1913 a Commissioner of the Board of Control, and was its chairman during the years 1916–18. He continued as an unpaid Commissioner after his retirement in 1921. The object of the dinner was to mark the affectionate esteem in which his late colleagues hold him, and their sense of his devotion to the cause of those suffering from mental disorders during his many years of public service—a period which, including the years spent as medical superintendent of the mental hospitals at Devizes and Powick, has extended to 56 years.

Second Garton Cancer Prize.

The Garton prize and medal has been instituted by the British Empire Cancer Campaign to promote investigations into the nature, causes, prevention, and treatment of cancer. A medal and an honorarium of £500 will be awarded to the person, or group of persons, who submits the essay embodying the results of original investigations which, in the opinion of the judges appointed by the Campaign, is the best contribution towards knowledge of the biological effects and mode of action of radiations upon malignant and other cells. The prize may be divided or reserved. Candidates must be British subjects domiciled in the British Empire, and dissertations must be received by Dec. 31st, 1933. Further particulars may be found in our advertisement columns. The subject of dissertations for the first Garton medal and prize (already announced in our columns) is the Early Diagnosis of Cancer. Entries for this prize must be received by Dec. 31st, 1931.

INDEX TO "THE LANCET," VOL. II., 1930.

THE Index and Title-page to Vol. II., 1930, which was completed with the issue of Dec. 27th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

OBITUARY

SIR ANDREW BALFOUR, K.C.M.G., C.B., M.D.,

DIRECTOR, THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

WITH great regret that will be shared by all the medical profession and many outside it we record the death on Friday, Jan. 30th, of Andrew Balfour. So diverse were his activities, and so noteworthy his achievements that it is difficult yet to assess the part he played in the development of tropical medicine and hygiene in this country in recent years. At the time of his death, as Director of the London School of Hygiene and Tropical Medicine, he had charge of an educational scheme of the first magnitude.

SIR ANDREW BALFOUR.

[*Photograph by Louis Schmidt.*

Born in Edinburgh 58 years ago—on March 21st, 1873—he was the son of Dr. T. A. G. Balfour, a well-known practitioner in that city and versed in the pharmaceutical action of drugs; from him Andrew derived that accurate knowledge of pharmacology and interest in the discovery of new compounds which were such a feature of his scientific activities. He passed the earlier years of his education in Watson's College and at the University of Edinburgh, and after matriculation he joined his father in practice in 1894. Soon, however, it became apparent that his inclinations were directed to the preventive rather than the curative side of medical practice. He became devoted to the developments of hygiene, seeing in the prevention of disease a task of an infinitely wider importance than its cure when established. Indeed, he looked forward, perhaps as a visionary, to that time when infectious disease shall be no more. He proceeded to Cambridge, to Caius College, in 1895, took the D.P.H. in 1897, and did a considerable amount of research work on typhoid in the newly created medical laboratories of the University. In 1898 he graduated M.D. of Edinburgh and gained the Gold Medal of the University with a thesis on the toxicity of dyestuffs and river pollution. He afterwards obtained the B.Sc. in public health subjects.

During the following years a love of travel and adventure, always dormant within him, was stimulated by the outbreak of the South African War. He served as a civil surgeon in 1900–01, and contracted typhoid himself in the fever camps of Pretoria. He emerged from this campaign with the South African Medal and three clasps, which constituted the beginnings of what he afterwards playfully referred to as his "herbaceous border." In 1901 he came under the influence of Patrick Manson, and that great man directed him, as he did at this period so many others, into the paths of tropical medicine, and became hereafter his guide and friend. In the following year Balfour went to the Sudan as Director of the Wellcome Tropical Research Laboratories, founded and presented to the city by Mr. H. S. Wellcome. He was appointed the first medical officer of health of Khartoum and there was every need for such a man to cleanse the Augean stables of the Khalifa and to transform them into what is to-day the modern, well-planned, well-sanitated city of Khartoum. He banished malaria from the town, making the mosquito a rare incident and the harbouring thereof a punishable offence. (It is related that he himself was the first offender in the new ordinance he introduced and was forced to fine himself ten shillings for the discovery of one such insect in "Balfour House.") His knowledge of Arabic, his personal ascendancy over the Sudanese, and his great personal energy and example triumphed over all difficulties. From dawn to dusk in the sweltering heat and "*habuba*" of Khartoum he was to be seen, urging, directing and training his sanitary corps in which were recruited all the scallywags of Khartoum. He transformed them into a smart body of men and gave point to his maxim that the care and health of native communities should be a feature of modern administration. His work in Khartoum brought him into personal contact with the great triumvirate of the British administration of the Sudan—Lord Cromer, Lord Kitchener, and Sir Reginald Wingate—all of whom became thereafter his close friends and supporters.

But the duties of organisation, vast and various as they were, did not absorb his energies. He undertook many scientific researches which have stood the test of time and which were embodied in the four quite exceptionally valuable reports of the Wellcome Research Laboratories which appeared from 1904–11. He must be given credit for several important protozoological discoveries, for classical work on spirochætosis of birds and of man, for the working out of the life-history of these organisms in the tick, and for the discovery of a leishmanoid disease of the skin—all of which researches are being confirmed to some extent and for the discovery of which he is now receiving full credit. In 1908 and again in 1911 he published, in collaboration with Major R. G. Archibald and other lieutenants, his reviews of recent advances in tropical medicine, which brought the influence of correlation to the literature of tropical medicine, and gave a distinct impetus to the movement which ended with the organisation of the Tropical Diseases Bureau in 1912. At this time, too, he conceived the idea of a floating laboratory for which a special vessel was constructed and presented to the Sudan Government by Mr. Wellcome. In this vessel, together with scientific colleagues, notably Dr. C. M. Wenyon, he explored the upper reaches of the White Nile and thereby contributed considerably to protozoological research. In 1913, after 11 years of fruitful service, he returned from the Sudan to become the founder of the Wellcome Bureau of Scientific Research, now in Endsleigh-gardens, W.C.1. In the latter part of this year he found time to undertake an extensive tour in the West Indies and South America, during which he stated his conviction from personal observation that the indigenous monkeys—

notably the red-howler monkey—were the reservoir hosts of yellow fever, a prophecy that has since, in part, proved to be correct.

With the outbreak of the Great War he resumed his military associations, and with the rank of lieut.-colonel was appointed a member of the Medical Advisory Committee to the Mediterranean Expeditionary Force. At first in Mudros, Salonika, and Egypt, and afterwards in Mesopotamia he did splendid service, becoming President of the Medical Advisory Committee, and suggesting and organising sanitary reforms throughout these areas of war. Later he was appointed scientific adviser in East Africa, and saw much of the campaign in what was German East Africa, travelling back via Uganda and the Nile to Egypt, whither he had been summoned to reorganise the health service of that country and to become President of the Public Health Commission. Later, in 1918, he was invited by General Allenby to Palestine to examine and advise generally on the antimalaria measures which constituted a feature in the decisive termination of that campaign.

He returned to England in July, 1918, an apparently worn out man, but early in 1919, with refreshed energies, he organised with almost demoniacal enthusiasm the Museum of the Wellcome Bureau of Scientific Research, and embarked on fresh scientific inquiries, notably on the infection of London rats with *Leptospira icterohæmorrhagiæ*. In 1921 and again in 1923 he undertook expeditions, at the instance of the Colonial Office, to Mauritius and to Bermuda to report upon the sanitary conditions prevailing in these islands and to make suggestions for their improvement—measures which have resulted in very considerable amelioration of health to the inhabitants. And then, in the latter part of 1923, he was appointed director of the London School of Hygiene and Tropical Medicine, an appointment which was made possible by the generosity of the Rockefeller Foundation, which had contributed a large sum for the building and equipment of this school. For the last seven years Balfour's boundless energy was devoted to the perfecting of this school, where his own twin subjects were to be taught and where research was to be undertaken on a scale hitherto unattempted in this country. He supervised every detail in the conception of the school and the structure of the building as it began to rear its head in Gower-street.

In 1926 he visited the Sudan as a guest of the Sudan Government at the opening of the Makwar Dam, and was hospitably entertained by many old friends; a few months later he was at Warsaw for the opening of the State Institute of Hygiene, and afterwards he crossed to the United States to deliver the opening address at the Johns Hopkins School of Hygiene. In 1925–27 he was President of the Royal Society of Tropical Medicine, and throughout his period was a member of many Government advisory committees. His over-strenuous life was now beginning to tell on him, and when in 1930 he was appointed FitzPatrick lecturer at the Royal College of Physicians of London he was away on sick leave. From this breakdown he never wholly recovered.

Amongst Andrew Balfour's contributions to medical literature may be mentioned his "Public Health and Preventive Medicine," 1902; "Memoranda of Medical Diseases in Tropical and Subtropical Areas," and (with H. H. Scott) a fine volume for the British Empire Exhibition on "Health Problems of the Empire" in 1924. But these form only a small part of a voluminous output in the form of lectures, reports, and formal addresses. He had a fine style and great facility, for in his student days he wrote five story books, of which the "Golden Kingdom," founded upon the tragedy of trypanosomiasis in Central Africa, achieved a considerable circulation, and all were characterised by a love of adventure and sport. For Balfour was a fine athlete, represented both his universities, Edinburgh and Cambridge, on the football field, while he played as a Scotch International forward in the Rugby matches of 1896 and 1897. His interest in Rugby football was maintained throughout, and during the present season he was elected president of the Scottish Rugby Union, an honour of which he was very proud.

Andrew Balfour was a man of quite exceptional charm; kind and straightforward, all were attracted to him by his modesty and sincerity. Single-minded and unflinching there never lived a more devoted disciple of science. He was created C.M.G. in 1912, C.B. in 1918, and K.C.M.G. in 1930. He was D.Sc. and LL.D. of the University of Edinburgh, LL.D. of Johns Hopkins and Rochester Universities, U.S.A., Fellow of the Royal Colleges of Physicians of London and Edinburgh; Cragg's Research Prizeman of the London School of Tropical Medicine in 1905, and won the Mary Kingsley medal of the Liverpool School in 1920.

Sir Andrew Balfour married in 1902 Grace, daughter of Mr. George Nutter, of Sidcup, and leaves a widow and two sons, the elder of whom is a member of the medical profession. They are assured of deep and wide sympathy.

Sir George Buchanan writes:—"No memoir of Andrew Balfour can omit the work of 1915–17. He was then among three or four of us who, with the label of the Medical Advisory Committee, went from area to area of the Eastern sphere of operations. We were despatched—late in the day—to Mudros, and thence to each of the Gallipoli beaches, Hellas, Anzac, and Suvla, returning to the mélange of armies and commands which found themselves in Egypt during 1915–16; sent across to Salonika on the first landing of the British troops, and again returned there when they were established in its "birdcage"; subsequently, after the fall of Kut, sent to participate and help, as far as sanitarians and epidemiologists could, in the splendid preparations which enabled Maude to cut through in Mesopotamia to Bagdad and settle events, in the way they were settled, in that critical area of the world war. Our task was to understand and advise upon existing epidemic disease and on risks of epidemics, and to deal with any other factors affecting the general health of the armies. At the time, and equally in retrospect, it is hard to say where we were inevitably futile, where we succeeded a little, or where, as I believe happened in a few cases, we were lucky enough to turn the balance to the right side. But whatever judgment might have been passed on our efforts as a committee, and our visitations from front to front, there was never any question about our carrying with us one great asset—namely, the personality of Andrew Balfour. It may have been an overworked medical officer in the front trenches, or a sanitary officer reduced to despair in handling unfamiliar and seemingly impossible conditions, or perhaps a hospital or base medical unit, feeling itself unappreciated or at sea in the midst of diseases of which its members had no experience—whoever they were, they were the better for him. On the one side he had things to tell them, from experience of the South African war or as an authority on tropical medicine, always

receptive of the latest news or sanitary designs. On the other, he could leave with them, and how often have I seen him do it, the contagious enthusiasm of a man out to give his best, enjoying life as he passed through it, full of the anecdote and the traditions of Edinburgh, the school and university which he loved; recognised from the very first contact as one inspired by the worthiest traditions of his profession and in whom no meanness could be found. His enthusiasm of the moment, the latest fly trap or vaccine, might or might not prove all that was expected of it. It was of little consequence; the leaven of courage and good endeavour was left and it continued to work long after his visit. Balfour had many and different interests and ambitions, but at heart he was always a romantic, and, looking back on those two or three fateful years, one is happy to think how well he then succeeded, and must have known that he succeeded, in giving proof of the ideals of devotion to his profession and to his country which were so deep in his nature."

Another close associate with Andrew Balfour in his later work writes: "It must be rare indeed that the passing of one man arouses so much personal sorrow in men's hearts. Andrew Balfour is dead! And there is not one of that host proud to be numbered amongst his personal friends who does not feel intense grief at the knowledge that this great, lovable personality has gone across the border. His achievements, starting out from the Edinburgh he loved so well, through Khartoum, Mesopotamia, Egypt, with their tale of honours tell of his services to tropical medicine, and his untimely end comes soon after the completion of that wonderful new home of hygiene and tropical medicine in Bloomsbury to which the last few years of his life were devoted with so burning a zeal. Such records are immediate and particular tributes to his work, but who shall assess the value of the influence on his fellows of his sterling honesty of purpose, of the intense personal affection which he inspired in everyone who came into contact with him? When one of his junior colleagues lay through a long illness at the Hospital for Tropical Diseases, not a day passed—not one day, week-day or Sunday—on which Balfour failed to visit him, if only for a minute or two to give him a cheery greeting and pass the time of day. Let the example stand as typical of the thoroughness and the devotion which this big, gentle soul showed in his work always and with his staff everywhere. Character is very nearly all that matters in the long run, and the world is definitely the poorer for that Andrew Balfour is no more."

JOHN EDWARD GEMMELL, M.B., F.R.S. Edin.

THE medical profession in Liverpool has sustained a severe loss by the death of Dr. John Gemmell on Jan. 24th, at the age of 67, after a long illness borne with exemplary patience. For many years he had been regarded as one of the leading obstetricians of the North of England.

A native of Liverpool, John Edward Gemmell was educated at the Liverpool Institute and at the University of Edinburgh, where he took the class prize in obstetrics and gynæcology and graduated in 1885. On returning to Liverpool, he was appointed house surgeon at the Royal Infirmary and soon made up his mind to devote his attention to obstetrics and the diseases of women. Having this end in view, he became Holt tutorial scholar in physiology and demonstrator in pathology at University College, Liverpool, and by holding these appointments he acquired a scientific outlook which was conspicuous in his later clinical work. His ability, his attractive personality, and his capacity for work were quickly recognised, and in 1890 he was elected honorary assistant surgeon to the Hospital for Women, Shaw-street, where he remained on the active staff for no less than 33 years. He also served on the honorary staff of the Liverpool Maternity Hospital, where he was one of the pioneers of antenatal work. The introduction of antenatal methods for out-patients aroused some opposition, and Gemmell was amused to recall the fact that when he first employed a pelvimeter, he was accused of carrying out operations in the out-patient department. A third post was that of honorary gynæcologist to the Victoria Central Hospital, Wallasey—an appointment which he retained until the beginning of his fatal illness.

Gemmell's reputation for exceptional powers of diagnosis, sound judgment and operative skill soon spread beyond the confines of hospital work, and he acquired a consultant practice which extended over the whole of the north-west of England and Wales. For a long time before his retirement from hospital work he was one of the busiest consultants in the north, but the demands of his practice were never allowed to interfere with his hospital engagements, nor did his social activities prevent him taking part in the development of his own specialty. He was not a prolific writer, but his contributions to the literature showed high merit. For many years he was an honoured member of the North of England Gynæcological and Obstetrical Society and rarely missed a meeting; he not only brought forward much pathological material and read various papers, but his verbal contributions were always acceptable and often illuminating. He served in all the offices open to members of this society, was president in 1903 and again in 1925, and attained an affectionate popularity that has rarely been equalled. He also gave his support to the Liverpool Medical Institution and was active in furthering the interests of his fellow members, who showed their appreciation of his work by electing him to the presidential chair in 1920–21. His years of office were eminently successful and he was able to initiate a long-needed endowment fund.

Outside his purely professional activities, Dr. Gemmell was an able and strenuous supporter of auxiliary branches of medical work. As a clinical teacher he devoted much time to medical students and he also took a great interest in the training and examination of midwives. He was always solicitous for the welfare of the younger men, and his advice and help were sought by many of his junior colleagues, who all learnt to regard him with sincere respect and affection. He gave his personal support to everything that could advance the best interests of the profession and was especially anxious for the success of the new College of Obstetricians and Gynæcologists of which he was a foundation Fellow. His public work for the hospitals to which he was attached was approved by lay committees and colleagues alike. His kindliness and capacity for inspiring and retaining confidence were invaluable when negotiations were set in progress for the amalgamation of the two Liverpool women's hospitals, and it was largely owing to his tact that these negotiations remained free from friction and were carried to a successful conclusion.

In spite of his professional engagements, Dr. Gemmell still found time for other activities. For many years he was associated with the old Royal Naval Volunteers as surgeon, and he was an indefatigable traveller, making many journeys to the continent of Europe and beyond. Only a year ago he spent three

months on a visit to Burma and Ceylon. He was keen on heraldry and formed an interesting and valuable collection of arms and armour. He was fond of books and published two of his presidential addresses on "Music and Medicine" and "Some Treasures of the Library" (of the Liverpool Medical Institution) in a brochure whose paper, printing, and binding revealed the bibliophile. "Those who were privileged to enter the circle of his household," writes a colleague, "were brought in contact with a home life of a truly ideal kind, and were made aware of the inspiration of his work and the chief source of his happiness. He lived a full, happy, and useful life, and although the loss of his two sons during the war was a lasting sorrow to him, there was no bitterness in his grief."

Dr. Gemmell's widow is left with one son, Mr. Arthur Gemmell, who practises at Liverpool in the same specialty as his father.

ARCHIBALD LEITCH, M.D. Glasg.

THE late Prof. Archibald Leitch, whose death we announced last week, was one of the small band of men whose whole working life was concentrated on different aspects of one central problem. He was never wearied or discouraged by the difficulties presented by cancer research and never sought relief in the pursuit of interesting side lines which had no obvious bearing on the ætiology of new growths. Born at Rothesay in 1878, Archibald Leitch was educated at Rothesay Academy, where he was mathematical medallist, and at the University of Glasgow, where he obtained bursaries in arts and in natural philosophy and mathematics. He was awarded the Bellahouston Gold Medal, the Dobbie-Smith Gold Medal for original research in botany, and the Black Medal for physics, and graduated M.B., Ch.B. in 1902. Throughout his career Leitch remained in close touch with his many friends in Glasgow and especially with the staff of the Pathological Department of the University where his visits were most welcome events.

PROF. ARCHIBALD LEITCH.

[Photograph by Elliott & Fry.

His first post was that of house surgeon to the Taunton and Somerset Hospital; he was then junior and later senior house surgeon to the Cancer Hospital, Fulham-road. While there, in 1904 he published in THE LANCET, jointly with Dr. S. J. Murdoch Cameron, his first communication to medical literature, in which the pathology of adenomyoma of the uterus and its relation to adeno-carcinoma is discussed. While at the Cancer Hospital Dr. Leitch definitely decided to embark upon cancer research. He received his early training under Prof. W. Lazarus-Barlow, as assistant director of the Cancer Research laboratories of the Middlesex Hospital. He left London to take up the post of director of the Caird Research Laboratory in Dundee, being given an honorary research fellowship in the University of St. Andrews in 1910. At this period Dr. Leitch did memorable work on the conditions of immunity to transplantable tumours, and on the pathology of multiple tumours in the uterus of the rabbit.

The outbreak of war found him back at the Cancer Hospital as pathologist to the routine department. He joined the R.A.M.C. (T.F.) and was put in charge of a mobile bacteriological laboratory in France, retiring with the rank of major when peace was declared. When Dr. A. Paine resigned in 1920 from the post of director of the research department of the Cancer Hospital, Leitch succeeded him and the pathological services of the hospital were united and developed under his control.

This reorganisation having been achieved, Dr. Leitch threw himself with all his energy into the study of experimental carcinogenesis, a line of work which had just been opened up by the work of Yamagiwa and Itchikawa. The few investigators who were then engaged in this work had produced cancer experimentally by continuing to apply tar to the skin of rabbits or mice until a visible change appeared, such as a formation of warts. Leitch showed that even when the application of tar was extended over a much shorter period and was then discontinued, so that the skin remained apparently unchanged, cancer of the skin would develop after an interval of several months in a certain number of animals. This was an important observation both in its theoretical and in its practical aspects. It demonstrated clearly that the conception of a precancerous state, the existence of which had been suspected on clinical grounds, was justified. Its practical aspect was that it removed the difficulty which up till then had stood in the way of accepting certain forms of cancer as being connected with a special occupation. The fact that workmen such as pitch and tar workers, shale oil workers, mule-spinners, who had been engaged in these occupations for only a limited number of years, would sometimes develop cancer many years after they had left their particular occupation, while men who had been engaged in the same occupation all their working lives remained free from cancer, had been argued as an insuperable objection to making the occupation responsible for the development of cancer. Dr. Leitch's observations cleared away these difficulties and placed the existence of occupational cancers in certain industries on a firm basis. His interest in the industrial aspects of cancer in man was deeply stirred and he was always keen to discuss the problem with those in authority at the Home Office. His later work was mainly connected with the further study of occupational cancer, and with the testing of various materials, such as tars, shale oils, lubricating oils, for their carcinogenic properties. Under his directorship the Research Institute of the Cancer Hospital took a leading place in the study of cancer.

Leitch's activities were not confined to work in his own hospital or even in this country. He was the general secretary (honorary) of the International Cancer Committee and a member of the Leeuwenhoek Vereeniging (an international association of cancer workers). From the inception of the British Empire Cancer Campaign he took a prominent part in its organisation. He was the honorary scientific secre-

tary to the Investigation Committee and to the Scientific Advisory Committee of the Campaign, and acted as editor of the substantial volume which formed the official report of the International Conference, held under the auspices of the Campaign in 1928.

Leitch was a polished writer, a forceful speaker, and when in his view the occasion demanded it, an outspoken critic. Among his scientific colleagues he had many friends, both in this country, and on the Continent and in America. They were attracted to him as much by his vigorous cheerful personality and his sound judgment and sense, as by common scientific interests. His widow, Dr. Ethel Leitch, and her four children, will have the sympathy of colleagues in many different lands for his loss will be widely felt.

Prof. Lazarus-Barlow writes:

"I first knew Leitch in 1906 when he became my assistant in the Cancer Research Laboratories at the Middlesex Hospital, and my appreciation of him and of his qualities steadily grew as the years went on. Perhaps his two outstanding characteristics were his independence of view and his sense of humour. He would always maintain any thesis he was supporting with acumen and vigour; he rather gloried in a Scottish combativeness, but argued ever with a twinkle in his eye and a humorous twist of his lips. On this account he was always a most stimulating colleague and though the argument might be left without arrival at any definite conclusion it bore fruit, if only in the mutual affection that it left between the combatants. There was nothing small or mean about Leitch; he had opponents, of course, to some of the views he put forward but no enemies. When I wrote to him deploring the death of H. B. Fry, his assistant at the Cancer Hospital, the letter he wrote back to me was heartbroken; it revealed an unsuspected affection for all those with whom he had worked in former years and for all his staff, and a devotion to cancer research that in conversation he would often hide with a jest. In type of mind Leitch was physiological rather than anatomical; we used to agree that he was a pathological descendant of Cohnheim, for he was assistant to me, I was assistant to Roy, Roy was assistant to Cohnheim, and something of Cohnheim's wonderful spirit had been passed on through each of us. The scientific world is poorer for his loss and cancer research has suffered a blow from which it will take some time to recover. But Leitch himself would have said, 'Get on with it, Cancer Research is the thing, not you or me.'"

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

Insanity and Divorce.

IN the House of Commons on Wednesday, Jan. 28th, Mr. HOLFORD KNIGHT asked leave to bring in a Bill to amend the law relating to matrimonial causes. He said the measure was supported on all sides of the House and was identical in terms with one which was introduced last year with the assent of a very large majority of the House. It proposed to amend the law relating to matrimonial causes by adding to the grounds of divorce the ground that the respondent had been incurably insane and had been so certified for a period of not less than five years continuously before the presentation of the petition. In order to avoid any abuse which might arise from this form of relief there was added a proviso that if the condition of insanity had been caused by the conduct of the petitioner the relief should not be granted. This ground was part of the recommendations of the majority of the Commission on Matrimonial Matters in 1912. The Commissioners said: "Indeed, incurable insanity is more effective in destroying the marriage relationship than any of the other causes which we recommend as grounds for divorce." The relief provided by the Bill was optional and no person was compelled to seek it. The condition of incurable insanity had to be proved to the satisfaction of the Court which had to consider all relevant circumstances.

Mr. LANG, in opposing the Bill, said that it raised very much more than ecclesiastical opposition. He asked the House whether it really thought that a definition of five years' insanity was a proper basis upon which permanently to dissolve the marriage relationship. He would have thought that their experience during the long debates on the Mental Treatment Act in that House would have taught hon. Members the extraordinary state of flux of medical opinion on the subject of insanity and he imagined that very few competent medical men would care, at the end of five years' continuous insanity, to certify any person as permanently insane. Since this Bill was last before the House he had received many letters—most of which he agreed were against the view he took and among them was a letter giving the case of a woman who had been in an asylum for ten years and nine months; she was then restored to full sanity and was now happily living with her husband. The possibility of divorce and remarriage of the healthy person and then this contretemps was too terrible to contemplate. It was dangerous to loosen the marriage tie to this extent. This was a Bill for which there was no real public demand from the general body of people who lived happily with each other. If it got on the Statute Book it would be the first step towards companionate marriages.

On a division, leave to bring in the Bill was refused by 148 votes to 114.

Representation of the Universities.

In moving the second reading of the Representation of the People (No. 2) Bill on Feb. 2nd, Mr. CLYNES (Home Secretary) said that the Bill provided for the abolition of plural voting by proposing the abolition of the business premises qualification and the abolition of the university constituencies. This was the last stage in the equalising of the suffrage between all members of the community. One exception was to be allowed under the Bill. It was proposed to leave the City of London quite undisturbed. The origin of university constituencies went back to 1603 when James I. granted by charter a right of representation in Parliament to the Universities of Oxford and Cambridge. That was the introduction of a very novel principle into the constitution and the representation of the personnel of the House of Commons at that time. He was certain that hon. Members would agree that it was not the intention of James I. to introduce at that time, or by that means, any popular or democratic element into Parliament. Indeed, the universities were already becoming more aristocratic and less inclined to respond to popular movements. In 1832 university representation did not seem to have been exposed to any serious attack by the franchise proposals which were then so long discussed. In 1867 the continuance of university constituencies was attacked by many notable radicals, and most notably by John Bright. In fact, however, a Member for London University was added. Disraeli defended this addition on the ground that it was desirable that the interests of education should be represented. In 1884 an attack on university representation was led by Bryce because it introduced political considerations into educational questions. Finally, the Act of 1918 preserved the representation of

Oxford, Cambridge, and London, grouped the other English universities into one constituency, and gave to the University of Wales and the Scottish universities some representation. For a university electorate of less than 120,000 12 Members were returned to that House, and with all respect he had failed to observe those high and approved qualifications of independence, depth of knowledge, and wide educational range. In so far as they were in possession of those qualifications he would like to have seen them more abundantly expressed in Parliament. It would not do in these days when they had an average constituency of, say, 60,000 electors for one Member, to give a round dozen of Members to the universities, and in the main Tory Members.

Sir S. HOARE moved the rejection of the Bill. He said that there was a time when university representation was open to the criticism that the universities were a class borough and that the voters were almost always Conservatives. That charge could no longer be made. The doors of the universities were now open wide and their franchise had been greatly extended.

The debate was continued for two days, and among those who spoke against the abolition of the university constituencies was Colonel Sinclair (Queen's University, Belfast), Miss Rathbone (Combined English Universities), and Sir Ernest Graham-Little (London University).

On a division taken on Tuesday, Feb. 3rd, the second reading of the Bill was carried by 295 votes to 230.

A Proprietary Medicines Bill.

The Parliamentary Medical Committee considered on Feb. 3rd the draft of a Bill, promoted by the Health Advisory Committee of the Labour Party, to regulate the manufacture, sale, and advertisement of proprietary medicines. The proposals, we understand, are of a drastic character going far beyond those of the Bill, which was read a second time in the House of Lords on July 29th, 1920, and not proceeded with. The text of this Bill, along with a transcript of the report of the Select Committee of the House of Commons on Patent Medicines, appeared as a special supplement to THE LANCET of Jan. 10th, 1925.

HOUSE OF COMMONS.

WEDNESDAY, JAN. 28TH.

Inspection of Imported Meat.

Mr. THORNE asked the Minister of Health on what grounds it was agreed at a recent conference held in his department that a relaxation should be made in the methods of inspection of mutton imported from Australia for caseous lymphadenitis, and that in future only 5 per cent. of Australian carcasses should be examined instead of 10 per cent. as formerly.—Miss SUSAN LAWRENCE (Parlimentary Secretary to the Ministry of Health) replied: At the conference which was recently held between Port Medical Officers of Health and Officers of my Department, it was reported that during the past year there had been a substantial improvement in the condition of mutton and lamb carcasses from Australia. It was therefore considered that the normal routine percentage examination of carcasses from this source might safely be reduced from 10 to 5 per cent. The arrangement is intended to operate for six months after which it may be reviewed; it does not, of course, affect the obligation on the officers of the port authority to make whatever further inspections may appear in any particular case to be desirable on grounds of public health.

THURSDAY, JAN. 29th.

Poor-law Relief in Dover.

Dr. HASTINGS asked the Minister of Health if his attention has been called to the case of Mrs. Gertrude Elizabeth Hunt, of Chapel Court, Dover, who died at the age of 34 from anæmia and general exhaustion from lack of suitable nourishment; and, seeing that this woman was in receipt of poor relief, what steps he was taking to see that the relief granted by public assistance authorities was adequate.—Mr. GREENWOOD replied: I have, at present, only seen a newspaper report of the case, but I am making inquiries and will communicate with my hon. friend as soon as possible.

Small-pox in London.

Rear-Admiral BEAMISH asked the Minister of Health whether the prevalence in London of small-pox had abated of late; and if he could compare London and other parts of the country in regard to this disease.—Mr. GREENWOOD replied: The weekly notifications of small-pox in London have been at about the same level for the last three months; they are, however, considerably lower now than in the corresponding period of last year. Relatively to the population the incidence of small-pox has recently been higher in London than in England and Wales as a whole.

Rear-Admiral BEAMISH asked the Minister of Health whether in recent outbreaks of small-pox in London the cases were found to have been vaccinated previously; and if he could give figures.—Mr. GREENWOOD replied: The large majority of the cases of small-pox in recent London outbreaks were persons in whom no evidence was found of vaccination prior to infection. Of the remainder, some were vaccinated during the incubation period of small-pox but too late to prevent the occurrence of that disease, and others had been vaccinated only in infancy. The latter were almost entirely adults, and included no person under the age of 11 years.

Mental Treatment Act.

Mr. KINLEY asked the Minister of Health whether it was proposed to make the experienced medical men from the existing public mental hospitals available as consultants in connexion with the developments under the recent Mental Treatment Act.—Mr. GREENWOOD replied: It is certainly hoped that, with the coöperation of the local authorities, the services of medical officers in public mental hospitals may become available, for example, in connexion with out-patient treatment and other developments under the Mental Treatment Act.

Flooding in Kensington.

Mr. WEST asked the Minister of Health whether his attention had been drawn to the flooding with sewage-tainted water of domestic premises in Kensington; whether plans had been prepared by the borough council of Kensington for the improvement of the main drainage system in the borough; and whether premises known to be liable to such flooding were still in use or had been evacuated.—Mr. GREENWOOD replied: I have made inquiry and understand that this flooding occurs only in times of very exceptional rainfall, and that the main sewerage system serving the borough is now otherwise sufficient. The premises which have experienced flooding are still in use, but any necessary cleansing has been done to the satisfaction of the local sanitary authority.

Royal Veterinary College.

Lieut.-Commander KENWORTHY asked the Minister of Agriculture whether he had now considered the copy of the resolution passed by the council of the National Veterinary Medical Association of Great Britain and Ireland, on Jan. 6th last, concerning the possibility of the closing down of the Royal Veterinary College in London and asking for assistance from the State; and whether he was considering taking action in view of the national and imperial importance of the college.

Mr. HANNON asked the Minister of Agriculture a similar question.—Major ATTLEE (Chancellor of the Duchy of Lancaster) replied: My right hon. friend has considered the resolution in question, but he regrets that he can add nothing to the reply which he gave on Nov. 27th.

Post of Pathologist Vacant in Lancashire.

Mr. KINLEY asked the Minister of Health whether he was aware that the post of pathologist in the area of the Lancashire Mental Hospitals Board had been vacant for several months; and whether he proposed to take steps to secure the filling of the post by a fully qualified pathologist.—Mr. GREENWOOD replied: I understand that this post is vacant. I hope that it will be filled, but the matter is wholly within the discretion of the Lancashire Mental Hospitals Board.

Employers and Health Insurance Contributions.

Mr. HAYDAY asked the Minister of Health how many insured persons had lost health insurance credit by reason of defaulting employers; in how many cases proceedings had been taken by the department against employers; and whether loss of credit, in these circumstances, was followed by loss of benefit to the insured person.—Mr. GREENWOOD replied: The information asked for in the first part of the question is not available. The number of cases in which legal proceedings for non-payment of health insurance contributions were taken against employers in England and Wales in 1930 was 1087, and in the great majority of those, although I cannot give the exact number,

the contributions were recovered and duly credited to the insured persons. Loss of credit, where it occurs, does not necessarily result in loss of benefit to the insured person, and in any event an insured person who has lost health insurance benefit through his employer's non-compliance is entitled under Section 98 of the National Health Insurance Act, 1924, to recover from him the amount lost.

Local Authorities and Venereal Disease.

Lieut.-Colonel FREMANTLE asked the Minister of Health whether any representations had been made to him, under Section 104 of the Local Government Act, 1929, in regard to local authorities who had undertaken no propaganda on the subject of venereal disease; the number of such authorities; and what action he proposed to take to remind them of their powers and responsibilities in the matter.—Mr. GREENWOOD replied: I have received representations from one voluntary association in regard to the need for further propaganda on the subject of venereal diseases by local authorities. The surveys now being made by Inspectors of my Department of the health services of local authorities include an investigation of the educational measures undertaken in each area on health questions, including venereal diseases. If it appears in any case that this matter is being neglected, appropriate action will be taken, but until the surveys are complete it will not be possible to say in how many areas no propaganda on this subject is being undertaken.

Insurance and Pensions Legislation.

Sir KINGSLEY WOOD asked the Minister of Health when it was anticipated that the inquiry into existing insurance and pensions legislation would be completed; and if any decisions had yet been made.

Mr. ALBERY asked the Minister of Health if he could make any statement regarding the general survey of the various national insurance and pension schemes on which the Government had been engaged since July, 1929.—Mr. GREENWOOD replied: A report has now been submitted by the Committee and is under the consideration of His Majesty's Government.

Slum Clearance.

Mr. MILLS asked the Minister of Health the number of slum-clearance schemes confirmed up to date since the passing of the Housing (No. 2) Act, 1930.—Mr. GREENWOOD replied: I have received from local authorities in England and Wales 95 resolutions declaring areas to be clearance areas within the meaning of Section I. of the Housing Act, 1930.

Mr. DAY asked the Minister of Health the number of slum-clearance schemes confirmed in the London area since Jan. 1st, 1929; and the number of persons who would require to be rehoused under these schemes.—Mr. GREENWOOD replied: Resolutions have been passed declaring 17 areas in London, occupied by 2174 persons, to be clearance areas under the Housing Act, 1930. These resolutions do not require confirmation by me. In addition, one improvement scheme under the old legislation, involving provision of rehousing accommodation for 2632 persons, was confirmed after Jan. 1st, 1929.

Mr. WEST asked the Minister of Health what schemes for clearance and improvement had been put forward by the borough of Kensington; how many persons would be provided for by these schemes; and what was the estimated cost to the ratepayers after allowing for Government grants.—Mr. GREENWOOD replied: The programme prepared by the Metropolitan Borough Council of Kensington in pursuance of Section 25 (2) of the Housing Act, 1930, contemplates that the schemes for clearance and improvement to be undertaken by the council during the next five years will result in the displacement of 400 persons. I understand that the council have already passed resolutions declaring two areas to be clearance areas; 275 persons will be displaced from these two areas. It is not possible at the present stage of the proceedings to estimate the cost of these two schemes.

Mr. MCELWEE asked the Minister of Health whether he would introduce legislation to enable tenants to be provided with alternative accommodation in all cases where houses were condemned and where a closing order had been obtained.—Mr. GREENWOOD replied: Under the Act of 1930 local authorities are given special financial assistance towards the provision of houses in the place of houses condemned and demolished by action of the authority, and I do not think that any such alteration in the law as my hon. friend has in mind is required.

MONDAY, FEB. 2ND.

International Patent Drugs Agreement.

Lieut.-Colonel FREMANTLE asked the Secretary for Foreign Affairs why His Majesty's Government had not yet become a party to the international agreement revising the agreement of 1906 for the unification o formulas for patent drugs, when 14 other countries were able to do so by August, 1929.—Mr. DALTON (Under-Secretary for Foreign Affairs) replied: H.M. Government propose to accede to the agreement at the earliest date possible, but, in accordance with the practice established at the beginning of the present Parliament, accession is not possible until the agreement has been laid before Parliament for 21 days. The agreement was duly laid on the table on Jan. 20th.

Lieut.-Colonel FREMANTLE: That does not answer my question as to why this agreement, which was published on August 20th, 1929, was not laid on the table of the House at an earlier date.

Mr. DALTON: The matter has been under consideration, and as we have decided that we were sure to ratify we have taken proper steps to that end.

Lieut.-Colonel FREMANTLE: Meanwhile has action been taken under such articles as were appropriate, and have the Permanent Secretariat been asked to consult the Commissions of the various nations as soon as possible? Had that been delayed about 18 months, and is not that an unreasonable delay?

Mr. DALTON: The hon. Member had better put a further question on the Paper.

Extermination of Rats.

Sir WILLIAM DAVISON asked the Minister of Agriculture what had been the result of the national rat week, held from Nov. 3rd to 8th last, and what was the estimated number of rats destroyed.—Dr. ADDISON replied: I have so far received reports on "rat week" from 295, or 43 per cent., of the local authorities; 79 per cent. of these have reported that action was taken with a view to drawing attention to the importance of destroying as many rats as possible, and to the best means of doing so. In a further 8 per cent. of cases it was reported that no special action had been taken as the work of destruction was continuous throughout the year. No statistics are available as to the estimated total number of rats destroyed during rat week, but it is believed that the efforts of last November resulted in heavy casualties.

Viscount LYMINGTON asked the Minister of Agriculture whether, in view of the plague of rats prevalent in many parts of the country, he was prepared to urge immediate concerted action by all local authorities in trying to exterminate these vermin.—Dr. ADDISON replied: In a circular letter issued to all local authorities on Sept. 10th last the Ministry called attention to the desirability of making a special effort to secure concerted action in November, and asked for the whole-hearted coöperation and support of the local authorities for this purpose. If the hon. Member will be good enough to furnish me with particulars of any areas where rats are unusually prevalent at the present time, I will make representations in the matter to the local authorities concerned.

Disposal of London Refuse.

Mr. MUGGERIDGE asked the Minister of Health what public health authorities of Essex in the area abutting on the Thames had made by-laws regulating the deposit of house and trade refuse within their boundaries; and whether he had approved such by-laws as sufficient to prevent the continuance of the present practice of dumping London's refuse within this area.—Miss SUSAN LAWRENCE (Parliamentary Secretary to the Ministry of Health) replied: Barking Town Urban District Council made by-laws on this subject some years ago, which were confirmed by my department. So far as my right hon. friend is aware no refuse from London is now tipped in that district. Orsett Rural District Council have recently made by-laws which are now under consideration, and Purfleet Urban District Council have by-laws in preparation. These by-laws are based on the precautions for the tipping of refuse recommended by my department.

Loans for Public Health Works.

Dr. MORRIS-JONES asked the Minister of Health whether applications for loans by public authorities in Wales for constructive works under the Public Health Acts were sanctioned or refused by him on the recommendation of the Welsh Board of Health.—Miss SUSAN LAWRENCE replied: Loans in respect of the following services are sanctioned by my right hon. friend on the recommendation of the Welsh Board of Health: tuberculosis sanatoria, venereal disease clinics, isolation and infectious diseases hospitals, maternity and child welfare centres, slaughter houses, markets.

TUESDAY, FEB. 3RD.

Strength of the R.A.M.C.

Lieut.-Colonel FREMANTLE asked the Secretary for War if he would state the establishment and present strength, respectively, of commissioned officers in the Royal Army

Medical Corps, distinguishing between permanent and temporary commissions; the number of permanent and temporary commissions now available; and the number of applications received for them up to Jan. 19th, 1931.—Mr. T. SHAW replied: Excluding quartermasters, the establishment of officers of the Royal Army Medical Corps, Regular Army, is 863. The number of officers at present in the Corps is 741, of whom 684 are regular officers, and the remaining 57 are temporary commissioned officers and retired officers who are employed to mitigate the shortage. There is no establishment for officers holding temporary commissions. Twenty-five vacancies for regular commissions in the Corps were offered last month, but only five candidates have come forward. The number of applicants for temporary commissions is very small.

Lieut.-Colonel FREMANTLE: Does the right hon. gentleman realise that that means that the Army is temporarily unfitted to take the field at the present time?

Mr. SHAW: I recognise that the shortage of medical officers is grave and that subject has been receiving very earnest consideration.

Medical Diary

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Feb. 9th.—5 P.M., UNITED SERVICES. Discussion on Antivenereal Prophylaxis in the Services. Opener: Surgeon-Cdr. H. R. B. Hull.

TUESDAY.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Discussion on The Use of High Carbohydrate Diets in the Treatment of Diabetes. Opener: Dr. E. P. Poulton.

THURSDAY.—8.30 P.M., NEUROLOGY AND PSYCHIATRY. Special discussion on Mental Symptoms Associated with Brain Tumours. Openers: Dr. W. J. Adie, Dr. Russell Brain, and Dr. Gordon Holmes, Neurology; Dr. R. D. Gillespie and Dr. F. Golla, Psychiatry. Other speakers will take part.

FRIDAY.—5.30 P.M. CLINICAL. (Cases at 4.30 P.M.) Cases: Mr. Cecil P. G. Wakeley: Generalised Paget's Disease with Sarcoma. Dr. A. D. Morris: Paget's Disease Complicated by Fractures. Dr. Bernard Myers: Effect of Insulin Treatment in a Woman with Diabetic Gangrene of the Foot. Effect of Insulin Treatment in a Boy with Diabetic Coma. Purpura in Diabetes. Dr. David Krestin: Mammary Secretion Associated with Enlargement of the Pituitary Fossa. Spontaneous Lactation Associated with Enlarged Pituitary Fossa. Benign Intrathoracic Tumour in a Boy. Mr. S. I. Levy: Tumour of the Neck for Diagnosis: ? Carotid Body Tumour. Dr. M. Schwartzman: Cases of Thrombo-angiitis Obliterans Treated with Muscle Extract. Dr. Philip Ellman: Pulmonary Asbestosis. Dr. E. Stolkind: Polycythemia Vera of 12 Years' Duration Treated by Blood-letting, Benzol, Rontgen Therapy, and Phenylhydrazine: Complications. Dr. H. V. Morlock: Banti's Disease with Rheumatic Endocarditis. Dr. G. L. Konstam: A Case of General Enlargement of Lymph Glands, Splenomegaly, Enlargement of the Head with Œdema of the Face. Dr. Terence East: Congenital Cardiac Defect. Specimen of Gastric Ulcer. Sir James Dundas-Grant: Tuberculosis of the Larynx with Pain Relieved by Alcohol Injection of the Superior Laryngeal Nerve. Epithelioma of the Larynx with Pain Relieved in the Same Way. Tuberculosis of the Larynx with Pain Instantly Relieved by Galvano-cautery. Other Cases will be shown. 8.30 P.M., OPHTHALMOLOGY. (Cases at 8 P.M.) Mr. J. H. Doggart: Retinitis Proliferans Complicated by Retinal Detachment. Other cases will be shown. Papers: Mr. J. H. Doggart: Recurrent Vascular Keratitis of Unknown Origin. Dr. Rosa Ford: A Case of Retrobulbar Neuritis Masked by Choroiditis, and Due to Latent Sinusitis.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY, Feb. 9th.—8.30 P.M., Dr. I. W. Magill will introduce a discussion on the Choice of Anæsthetic.

WEST KENT MEDICO-CHIRURGICAL SOCIETY, Miller General Hospital, Greenwich, S.E.

FRIDAY, Feb. 13th.—8.45 P.M., Dr. F. M. R. Walshe: The Interpretation of Some Common Symptoms of Nervous Disease.

PADDINGTON MEDICAL SOCIETY.

TUESDAY, Feb. 10th.—9 P.M. (at the Great Western Royal Hotel, Paddington), Dr. H. R. Oswald: Reminiscences of Some Paddington Inquests.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY, 11, Chandos-street, Cavendish-square, W.

THURSDAY, Feb. 12th.—8.30 P.M., Dr. Hilda Weber: Some Mechanisms Operative in Psychotherapy.

BIOCHEMICAL SOCIETY.

SATURDAY, Feb. 13th.—5 P.M. (at the Lister Institute, Chelsea Bridge-road, S.W.), Communications.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace road, S.W.

TUESDAY, Feb. 10th.—6 P.M., Lieut.-Colonel William Butler will open a discussion on Recent Methods of Sewage Treatment.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Feb., 9th, to SATURDAY, Feb. 14th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, Mon., 4 P.M., free lecture by Mr. Herbert Paterson: Early Diagnosis of Gastric Cancer.—CANCER HOSPITAL, Fulham-road, S.W. Wed., 2 P.M., free demonstration by Mr. C. A. Joll: Carcinoma of the Stomach, Illustrated by Specimens and Cases.—MILLER GENERAL HOSPITAL, Greenwich, S.E. Thurs., 3 P.M., free demonstration in Pathology by Dr. W. Smith.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. Fri., 4.30 P.M., lecture by Mr. Rodney Maingot: Special Measures *before* Abdominal Operations.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Special Course in Gynæcology. Second week.—HOSPITAL FOR TROPICAL DISEASES, Gordon-street, W.C. Intensive Course.—Further particulars from the Fellowship of Medicine.

KING'S COLLEGE, Strand, W.C.

MONDAY, Feb. 9th.—5.30 P.M., Prof. J. Barcroft: Constancy of the Internal Environment (3).

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.

THURSDAY, Feb. 12th.—9 P.M., Dr. E. ff. Creed: Serum Therapy: Its Use and Abuse.

UNIVERSITY COLLEGE MEDICAL SCHOOL, University-street, W.C.

TUESDAY, Feb. 10th.—5.15 P.M., Dr. W. Cramer: Filtrable Tumours.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, Agar-street, W.C.

SUNDAY, Feb. 8th.—10.30 A.M., Dr. R. A. Hickling: Diagnosis and Treatment of Glycosuria. 11.45 A.M., Mr. H. E. Batten: Injuries and Diseases of the Hip Joint.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE (Public Health Division), Keppel-street, Gower-street, W.C.

MONDAY, Feb. 9th.—5 P.M., Col. L. W. Harrison: Gonorrhœa.

WEDNESDAY.—5 P.M., Col. Harrison: Syphilis.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, Feb. 9th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Ear, Nose, and Throat Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, Throat and Ear Clinics. Operations.

FRIDAY.—10.30 A.M.: Ear, Nose, and Throat Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Children's Diseases Clinics. Operations.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, Feb. 13th.—4 P.M., Mr. N. Asherson: Complications of Tonsillectomy.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Feb. 10th.—3.15 P.M., Mr. McNeill Love: Ward Demonstration.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.

WEDNESDAY, Feb. 11th.—4 P.M., Mr. W. H. Ogilvie Infections of the Hand.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, Feb. 11th.—4 P.M., Dr. C. E. Lakin: Demonstration of Medical Cases.

CITY OF LONDON MATERNITY HOSPITAL, City-road, E.C.

THURSDAY, Feb. 12th.—5 P.M., Dr. Sydney Owen: The Care of the New Born Baby.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, Feb. 9th.—12 noon, Dr. Greenfield: Lipoid Dyscrasias of the Nerve Cells. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Intracranial Complications of Otitis and Sinusitis.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie: Migraine.

WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Critchley: Chorea in the Adult.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Re-educative Exercises.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Feb. 10th.—5 P.M., Sir E. Graham-Little: Cicatricial Alopecia.

THURSDAY.—5 P.M., Dr. H. Haldin-Davis: Pruritus. Prurigo. Lichenification.

NATIONAL COUNCIL FOR MENTAL HYGIENE.

THURSDAY, Feb. 12th.—5.15 P.M. (at the Medical Society of London, 11, Chandos-street, W.), Mrs. Neville-Rolfe: Modern Marriage and Its Problems.

ST. MARY'S HOSPITALS, Manchester.

FRIDAY, Feb. 13th.—4.15 P.M. (at the Whitworth-street West Branch), Dr. W. Fletcher Shaw and Dr. J. W. Bride: Antenatal Demonstrations.

NOTES, COMMENTS, AND ABSTRACTS

SCOTTISH NATIONAL RED CROSS HOSPITAL AT BELLAHOUSTON.

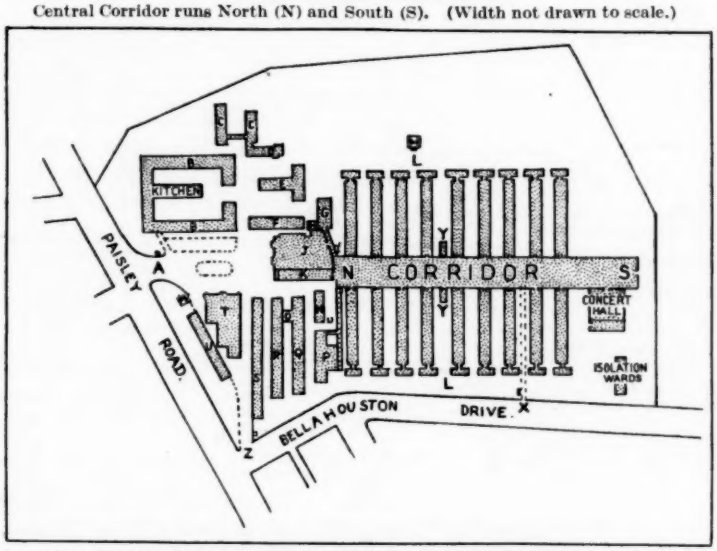
IN spacious Victorian times hospitals were built in massive blocks of masonry. These have proved expensive to keep up and uneconomical in the return which they give in accommodation for the heavy capital outlay. With the war came the single-storey, pavilion type of hospital, which could be erected cheaply and quickly and could be duplicated easily, without increasing administrative buildings or general services. Experience of this type of building showed that it had great value as a permanent structure. At the beginning of the war a central corridor and bungalow type of hospital was built at Cambridge, and when in 1915 the Scottish Committee of the Red Cross resolved to erect a large general hospital, they decided to build on the Cambridge plan.

A site was furnished at Bellahouston Park, Glasgow, and single-storey bungalows were built of asbestos sheeting, the choice of material being largely determined by war conditions. The structure was completed in three months and consisted, as the illustration shows, of a central corridor with ward blocks opening off it. Between the hospital proper and the main road were the offices, including recreation room, doctors' and nurses' quarters, pathological department, operating theatre, and electrotherapy room. The hospital began with 500 beds and its accommodation was increased to 1200 without any interference with its work. Each ward was complete in itself, having six small rooms at the corridor end—one for the sister, one for clerical work, one linen room, one ward kitchen, and two rooms for special cases. Each was far enough from the next to allow space to wheel the beds out into the open air. The central corridor could be expanded indefinitely to allow more wards to be built. At its far end was an entrance for the patients' friends, while the staff entered from the other end, where the administration blocks lay.

Bellahouston Hospital has now been closed and dismantled, but so notably did it serve its day and its generation that Sir George Beatson has written an account of it in the *Glasgow Herald* in order that its story should be preserved from oblivion. Apart from its service to 15,000 sick and wounded in the war, the building has been an educative factor in hospital construction. With its 1200 beds it cost £100,000, and its memory will stand for a perpetual reminder of the effectiveness and simplicity of the corridor type of hospital building.

PLAN OF THE HOSPITAL.

Central Corridor runs North (N) and South (S). (Width not drawn to scale.)



A, main entrance; B and C, nurses' quarters; D, matron's quarters; E, doctors' quarters; F, administrative block; G, General operating theatre; H, small operating theatre; J, building for baths, massage, electricity, radiant heat; K, receiving block; L, ward blocks; M, bandstand; N, boiler house and destructor; O, billiard room; P, kitchen block; Q, dining and recreation block; R, orderlies' quarters; S, hospital stores; T, curative workshops; U, pathological block; W, garage; X, entrance for patients' friends; Y, nurses' cloak room; Z, entrance for stores.

REBUILDING SOMERS TOWN.

THE first block of the Sidney-street estate, built by the St. Pancras House Improvement Society, was recently opened. Forty flats are contained in the block, each one provided with adequate lighting, space, and ventilation, and furnished with an electric copper, cooker, iron, and kettle, as well as an electric heater which can be transferred to any of the rooms. A constant supply of hot water will simplify the housewife's work, and make hot baths available at any time. The work of improvement is described in "Housing Happenings," the organ of the society, in which illustrations show the dilapidated buildings from which the tenants of the new flats are being drawn. Great projects are in hand for the cultivation of gardens in the overcrowded areas round Somers Town, and one of these is now being constructed in the courtyard at Drummond-crescent. Among other activities, the society runs a girls' club and a nursery school. The next block of flats projected in Sidney-street will have a new nursery school on the top floor with a roof garden adjoining. The work depends entirely on voluntary contributions.

IF IT HAD HAPPENED OTHERWISE.

AN undue sense of insignificance may be lessened by reflecting that at any moment any of us may inadvertently decide the fate of nations. The stream of events is easily turned aside by trifles; civilisations rise or decline because a statesman has a headache, a schoolboy upsets a bottle of ink, or a spider decides on safety first. Contemporaneously we never know what is going to prove important, but in retrospect it is fascinating to consider what would have happened if history had taken a slightly different turn and followed another of its infinitely numerous alternative routes.

Guesswork of this kind is apt to fail for want of imagination and scholarship, but these are happily combined in a book[1] of fictitious history now produced with J. C. Squire as editor. The essays here collected promise much by their names and authorship, but their performance is even more satisfactory. The more serious contributions deal with the continuation of persons and policies whose general trend is known. Thus Emil Ludwig supposes that the Emperor Frederick did not have cancer, allows him to recover from his famous illness, and avoids the late war by a judicious mixture of Bismarck's foreign policy with

[1] If It Had Happened Otherwise: Lapses into Imaginary History. Edited by J. C. Squire. Longmans, Green and Co., London, New York, and Toronto. Pp. 289. 21s.

the Empress Victoria's English ideas of a liberal constitution. Milton Waldman, in one of the most brilliant and convincing essays of the book, shows us the end of Lincoln's career as it might have been if Booth's bullet had missed him. Winston Churchill (the English one) chooses much the same period and altogether changes European as well as American politics by making Lee win the battle of Gettysburg. H. A. L. Fisher gives Napoleon a South American empire and André Maurois offers him several different and ignominous ends as a result of the failure of the French revolution. Maurois holds that, after all, the present state of Europe would have been very much the same without the revolution, but Hilaire Belloc (who is in excellent vein) thinks that the escape of Louis XVI. at Varennes would have condemned us to fight the war of 1914 (with the Holy Roman Empire) in sailing ships. G. K. Chesterton is mainly concerned with the reunion of Christendom and offers posterity the perfect love affair in the marriage of Mary Queen of Scots and Don John of Austria. Harold Nicolson dethrones Byron the adventurer by making him an ineffective king of Greece, while Philip Guedalla, Ronald Knox, and the editor find scope for their exceptional talent as parodists.

These Lapses into Imaginary History (as they are called) show once more that fiction can be as strange as truth and quite as instructive. In some ways it is rather more amusing, and Mr. Squire's venture is undoubtedly going to give a lot of pleasure all round.

THE EARTHQUAKE IN NEW ZEALAND.

THE disastrous earthquake in Hawke's Bay Province, North Island, New Zealand, has struck Napier, the chief city of the provincial district, and many fine buildings and private residences have suffered severely. Hastings, 12 miles distant, is also involved in the catastrophe. There are 20 medical men in Napier and eight in Hastings, and, for the sake of others as well as of themselves, we trust they have escaped injury.

Appointments

ATKINSON, E. M., F.R.C.S. Eng., M.B., B.S.Lond., Hon. Surgeon to the Royal Mineral Water Hospital, Bath

BRETT, H. C. M., L.R.C.P. Lond., M.R.C.S., Certifying Surgeon under the Factory and Workshop Acts for the Cranbrook District of the County of Kent.

GALBRAITH, J. J., M.D., Ch.B. Edin., D.P.H., Medical Officer of Health for County Ross and Cromarty.

HALLIDAY, J. L., M.D. Ch.B. Glasg., D.P.H., a Regional Medical Officer (Medical Referees) to the Department of Health for Scotland.

RIDDELL, J., M.B. Ch.B. Glasg., Asst. Medical Officer for the County of Stirling.

Vacancies

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Hon. Asst. Medical Electrician and Radiologist.

All Saints' Hospital, 91, Finchley-road, N.W.—Hon. Asst. Surgeon.

Barnsley, Beckett Hospital and Dispensary.—Cas. O. Also H.P. £250 and £200 respectively.

Barry, U.D.C. Surgical Hospital.—H.S. £200.

Bedford County Hospital.—Asst. H.S. At rate of £130.

Bedfordshire County Council.—Deputy County M.O.H. and Sen. Asst. School M.O. £750.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—Asst. Surg. 50 gns.

Birmingham, Erdington House Poor-law Institution, &c.—Res. M.O. £850.

Birmingham and Midland Eye Hospital.—Res. Surg. O. £110.

Birmingham City Education Committee.—Director of Child Guidance Clinic and Special Schools M.O. £600–£700.

Bristol City and County Mental Hospital.—Third Asst. M.O. £350.

Bristol Royal Hospital.—Radium Officer. £600.

Canterbury, Kent and Canterbury Hospital—H.S. At rate of £125.

Carlisle, Cumberland and Westmorland Mental Hospital, Garlands.—Jun. Asst. M.O. £350.

Chester Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept. £150.

Chester, Wrenbury Hall Tuberculosis Training Colony.—Res. H.P. £250.

Coventry and Warwickshire Hospital.—Res. H.P. £160.

Coventry City Municipal Hospital.—Second Asst. M.O. £250.

Coventry, Municipal Hospital.—2nd Asst. M.O. £100.

Denbigh, North Wales Sanatorium, Llangwyfan.—3rd Asst. Res. M.O. £250.

Derby County.—Deputy County M.O.H. £840.

Derby, Derbyshire Royal Infirmary.—Two H.S.'s to Special Depts. Also Ophth. H.S. Each £150.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—Surgeon to Nose, Throat, and Ear Dept.

Erelina Hospital for Children, Southwark, S.E.—Hon. Dental Surgeon.

Gloucestershire Royal Infirmary and Eye Institution.—2nd H.S. At rate of £120.

Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300.

Hull Royal Infirmary.—H.P. for Sutton Branch. At rate of £160.

Inverness Royal Northern Infirmary.—H.S. At rate of £100.

Lewisham Hospital, High-street, Lewisham.—H.P. £80.

Liverpool, David Lewis Northern Hospital.—H.S. two H.P.'s. Each at rate of £100.

Liverpool, Royal Children's Hospital.—Res. M.O. and 2nd Res. M.O. for Heswall Branch. At rate of £180 and £120 respectively. Also two Res. H.P.'s and two Res. H.S.'s for City Branch, Myrtle-street. All at rate of £100.

Liverpool Eye and Ear Infirmary, Myrtle-street.—Ophth. H.S. £100.

Liverpool, Royal Southern Hospital.—H.S. At rate of £60.

L.C.C.—8th Asst. M.O. for Mental Hospitals Service. £445.

London Hospital, E.—Surg. 1st Asst. and Reg. £300.

Maidstone, Institution for Mental Defectives, Leybourne Grange.—Res. Med. Supt. £700.

Manchester Royal Infirmary.—H.S. for Central Branch, Roby-street. £100–£200.

Manchester Victoria Memorial Jewish Hospital, Cheetham.—Jun. H.S. At rate of £125.

Margate and District General Hospital.—Res. M.O. £125.

Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Clin. Asst.

Metropolitan Hospital, Kingsland-road, E.—Physician.

Newcastle General Hospital, Newcastle-upon-Tyne.—H.P. At rate of £100.

Nottingham County Sanatorium, Sherwood Forest.—Med. Supt. £650.

Nottingham Hospital for Women.—H.S. At rate of £150.

Nottinghamshire County Council.—Med. Supt. for Ransom Sanatorium. £650.

Oldham Royal Infirmary.—H.S.'s to Special Depts. Each at rate of £175.

Plymouth, South Devon and East Cornwall Hospital.—Res. Anæsthetist and H.S. to Spec. Depts. At rate of £100.

Poplar Metropolitan Borough, Maternity and Child Welfare Clinics.—Part-time M.O. 1½ gns. per session.

Prince of Wales's General Hospital, N.—Hon. Surg. Reg. £100

Queen's Hospital for Children, Hackney-road, E.—Second Surg. to Ear, Nose, and Throat Dept.

Royal Northern Hospital, Holloway, N.—Hon. Surg.

St. Bartholomew's Hospital, E.C.—Dental H.S. £80.

St. Benedicts Hospital, Church-lane, Tooting, S.W.—Asst. M.O. £250.

Sheffield, Royal Hospital.—Ophth. H.S. £120. Also Res. Anæsthetist. £80–£100.

South Shields, Ingham Infirmary.—H.S. £150.

St. Thomas's Hospital.—Chief Asst. to Throat Dept.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S. £150.

Surrey County Council.—Asst. M.O. £600.

Swanley, Kent, Hospital Convalescent Home.—Res. M.O. At rate of £200.

Tilbury Hospital, Essex.—H.S. At rate of £150.

Tunbridge Wells and Counties General Hospital.—H.S. £160.

Ventnor, Isle of Wight, Royal National Hospital for Consumption and Diseases of the Chest.—Asst. Res. M.O. At rate of £300.

Wakefield, West Riding Mental Hospital.—Jun. Asst. M.O. £400.

West Bromwich and District General Hospital.—Hon. Physician and Hon. Surgeon. Also H.S., H.P., and Cas. H.S. All at rate of £200.

Weston Super-Mare General Hospital.—Res. H.S. At rate of £150.

Winchester, Royal Hampshire County Hospital.—Sen. Res. M.O. £200.

Wolverhampton, Royal Hospital.—H.S. for Ear, Throat and Nose Dept. At rate of £100.

The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Stock (Essex).

Births, Marriages, and Deaths

BIRTHS.

CRESWELL.—On Jan. 25th, the wife of H. E. Creswell, M.B., M.C., of Rosignol, Glencoe, Natal, South Africa, of a son.

HAMBER.—On Jan. 27th, at Lowlands, Fordingbridge, Hants, the wife of J. F. Hamber, M.R.C.S., L.R.C.P., a son.

DEATHS.

CRISP.—On Jan. 29th, of pneumonia, Ernest Henry Crisp, B.A., M.R.C.S., L.R.C.P., of Harley-street, W.

GALE.—On Jan. 29th, Thomas William Gale, L.D.S., R.C.S.I., of Lichfield-grove, N., and Devonshire-street, W., in his 84th year.

HOFFMAN.—On Jan. 31st, 1931, at The Red House, Cranham, Gloucester, Arthur Herbert Hoffman, aged 75.

LEITCH.—On Jan. 27th at Highgate, Prof. Archibald Leitch, M.D., Director of Research, the Cancer Hospital, London, aged 52.

WILSON.—On Jan. 27th, at Great Russell-mansions, W.C., Dr. Samuel Wilson, late of Mare-street, Hackney, and "Chesterleight," Boscombe.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.